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ANATOMICAL OUTLINES

PART I.

LONDON : PRINTED BY
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ANATOMICAL OUTLINES

FOR THE USE OF STUDENTS IN THE DISSECTING ROOM

AND SURGICAL CLASS ROOM

BY

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WITH ORIGINAL DRAWINGS by ARTHUR E. FISHER

LEEDS SCHOOL OF MEDICINE

PART I.—THE UPPER LIMB

CONTAINING THIRTY-ONE PLATES, WITH EXPLANATORY TABLES

LONDON

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1878

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TO

ROBERT LIVEING

DOCTOR OF MEDICINE

LECTURER ON DERMATOLOGY AND LATE LECTURER ON ANATOMY

AT THE MIDDLESEX HOSPITAL

THESE ANATOMICAL OUTLINES

ARE DEDICATED

AS A SLIGHT TOKEN OF ADMIRATION FOR HIM AS A

PRACTICAL TEACHER AND ESTEEM FOR HIM

AS A COLLEAGUE AND FRIEND

PREFACE.

THE VALUE of drawing as a training for the hand and the eye has scarcely been sufficiently recognised by our medical schools.

Some years ago the Author ventured to draw attention to the value of drawing, as a means of acquiring and retaining that exact knowledge of detail which each year more and more overtaxes the student.[1]

These 'Outlines' are a first endeavour to bring these views to a test, and to supply an existing want.

The object of the present work is to enable the student of Human Anatomy to record in simple outline the more important structures his scalpel lays bare in the course of his dissections. By the plan here suggested, the patience and skill he displays in making a good dissection are at once turned to practical account, for a few lines made with his pencil will preserve the results of his labour in a permanent form.

Facts in anatomy should be impressed on the mind by appealing to the eye, and the practice of drawing a dissection is among the best of all methods for attaining this end. It impresses in a clear and definite manner the numerous details it is necessary to remember. In reading an anatomical description, the mind of the student instantly creates an image. An illustration therefore becomes of the first importance in helping him to shape it aright. He will remember more surely by depicting his dissections, and his knowledge will be more complete and lasting.

[1] *Lancet*, Oct. 24, 1868.

The Author believes that a student who follows the advice here given will find his labour lightened, and seldom wasted. He will dissect with more care, and will remember with greater ease.

The importance of surface anatomy in its relation to surgery cannot be over-estimated. The learner anxious to commence his dissection is apt to neglect superficial landmarks. These are the guides, however, which lead the surgeon surely and safely to the deeper structures which he exposes in operations. They are, moreover, of the highest importance in the diagnosis of fractures and dislocations. These 'Outlines,' it is hoped, will assist in training the eye to a correct knowledge of this branch of anatomy. It bears directly on the success of future work, and it is well when this is early recognised. To those who have finished their work in the dissecting-room, who are learning the practice of surgery in the hospital ward and in the operating theatre, the 'Outlines,' it is believed, will be of service. The curved incision commonly used for removal of the wrist-joint, for example, requires a knowledge of the parts beneath. This can be shown by a line, and its exact relation to the bony points clearly perceived. The structures which are cut through, and those which should be avoided during the operation, can all be filled in. An operation is thus seen, as it were, and the student can appreciate its *anatomical* bearings, almost as thoroughly as if he had performed it on the dead subject. Such practice cannot fail to be useful to him when his skill is called for in the removal of actual disease.

Surgery should never be divorced from anatomy, as it too often is. From the first, the two should rather go hand in hand. A practical teacher would desire to hear more of surgery in the dissecting-room and more of anatomy in the ward. The highest aim and the real endeavour of all anatomical teaching should be to send into the world sound practitioners rather than accomplished

anatomists. The student who fills in and completes these 'Outlines,' guided by his actual dissections, will easily manage to illustrate nearly all he sees of an operation—and he will be doing much to place anatomy and surgery in their true relations one to the other in the system of medical study.

The Author wishes to express his great obligations to his friend Mr. ARTHUR E. FISHER, whose patience, artistic knowledge, and careful work have so largely contributed to the value of these 'Outlines.' Indeed, it is mainly owing to his kindly co-operation that their publication is undertaken at the present time.

To Messrs. J. MILLIKIN & Co., of St. Thomas' Street, his best thanks are due for the loan of a well-marked and carefully articulated skeleton for the special use of this work.

The Author is indebted to Mr. M. STUART, of the Liverpool School, for several valuable suggestions.

33 HARLEY STREET, CAVENDISH SQUARE, W.
January 1*st*, 1878.



ADVICE.

The student is advised, after commencing the dissection of a region, to indicate on the 'outline' the incisions he has made in order to reflect the skin. In this way the part he is about to fill in is marked out, and he follows with his pencil the incisions he has previously made with his scalpel.

It will be well, as his dissection progresses, first to outline the muscles, having previously ascertained as far as possible their exact attachments by dissection. Their general shape and superficial limits may be shown by *continuous* lines; their attachments beneath, which are often ascertained best after division, may be shown by *dotted* lines.

The arteries, important veins, and nerves may then be added. Wherever these are hidden by overlying structures, their course can be indicated by dotted lines. At his leisure he may complete his drawing. This is most satisfactorily done by using for the muscles thin washes of transparent colours. The arteries and veins may be shown in darker tints. The ligaments and tendons may be coloured with *gamboge*, and the nerves afterwards picked out with Chinese white, or with some other colour.

If the deeper muscles be coloured in with a wash of *blue*, and those more superficial with a wash of *lake*, a transparent drawing is made, which will show not only the origin and insertion of the muscles, with their deeper connections, but the relation of all these to the skeleton beneath, and often their bearing on surface form.

The structures which it is thought expedient to portray in each

region are named opposite each outline. The student, however, can follow to a certain extent his own taste in this matter. If he be skilful with his pencil or brush, he can introduce into a single outline several layers of muscles by means of transparent washes.

He can, if he chooses, finish some of the outlines more highly.

Those who have but little knowledge of drawing can mark the origin and insertion of muscles, and indicate the course of the principal vessels and nerves by mere strokes. Such a method may be rough, but it is clear and simple, and will be a great help to the memory, particularly where a muscle has wide attachments, or when it arises from several bones.[1]

As the 'Outlines' are designed to show the human body, as a whole rather than in parts or regions, the student can in many instances work beyond his special dissection. He may carry out the same method, or may vary the process, as he finds best. The lines he first makes to limit his drawing will not interfere with this plan; but he should remember that those structures alone are named which are fairly contained within the limits of a given region, and which can be wholly or in part indicated with clearness and advantage. Should he utilise the whole outline in this manner, the dissections before him will be the best guides, and he will be safe in following them. A list of the structures, which may be filled in, faces each outline. Those muscles printed in *italics* indicate that they are for the most part, or entirely, hidden by superficial structures.

An asterisk following a muscle is intended to show that it is removed. It is named again in order to remind the dissector that he will do well to mark again its attachments. He may use *red* for the origin and *blue* for the insertion. Coloured ink, used with a pen, will make his work neat and rapid.

Filling in an outline will be found an excellent test of growing knowledge, and by this simple method he will do much, as his facts accumulate, to save the drudgery of incessant repetition. If he be dissecting a right limb, he can use the outlines of the left for this purpose, as well as for recording occasional abnormalities.

[1] The Trapezius is a good example of the first condition, and the Flexor Brevis Pollicis of the second.

The blank pages will be found useful for the registration of notes or hints he is certain to gather whilst at work.

Lastly, he should bear in mind that no two bones are exactly alike. They differ as widely as human faces. The author has endeavoured to choose typical examples. He has tested all the doubtful points on the dead subject by comparison as far as possible with the living. In no case has the artist trusted entirely to the fancy of the articulator.

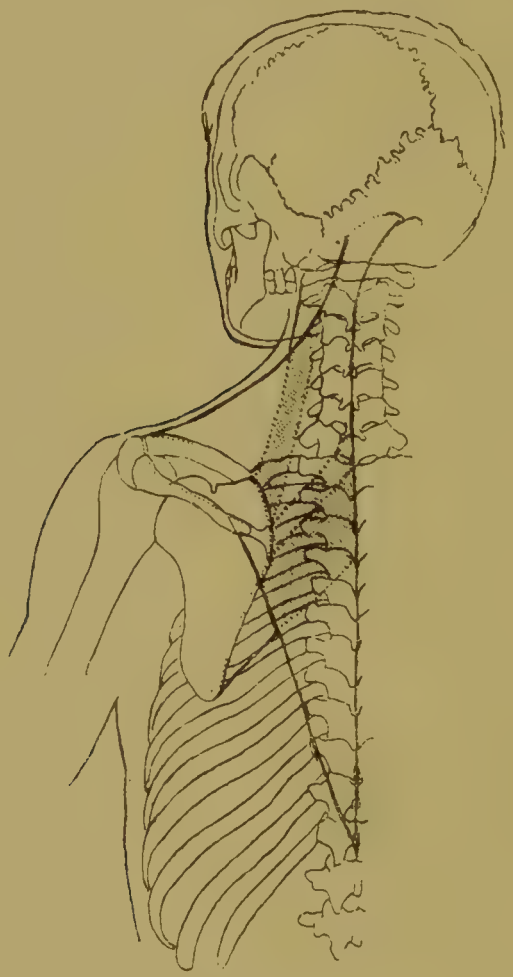
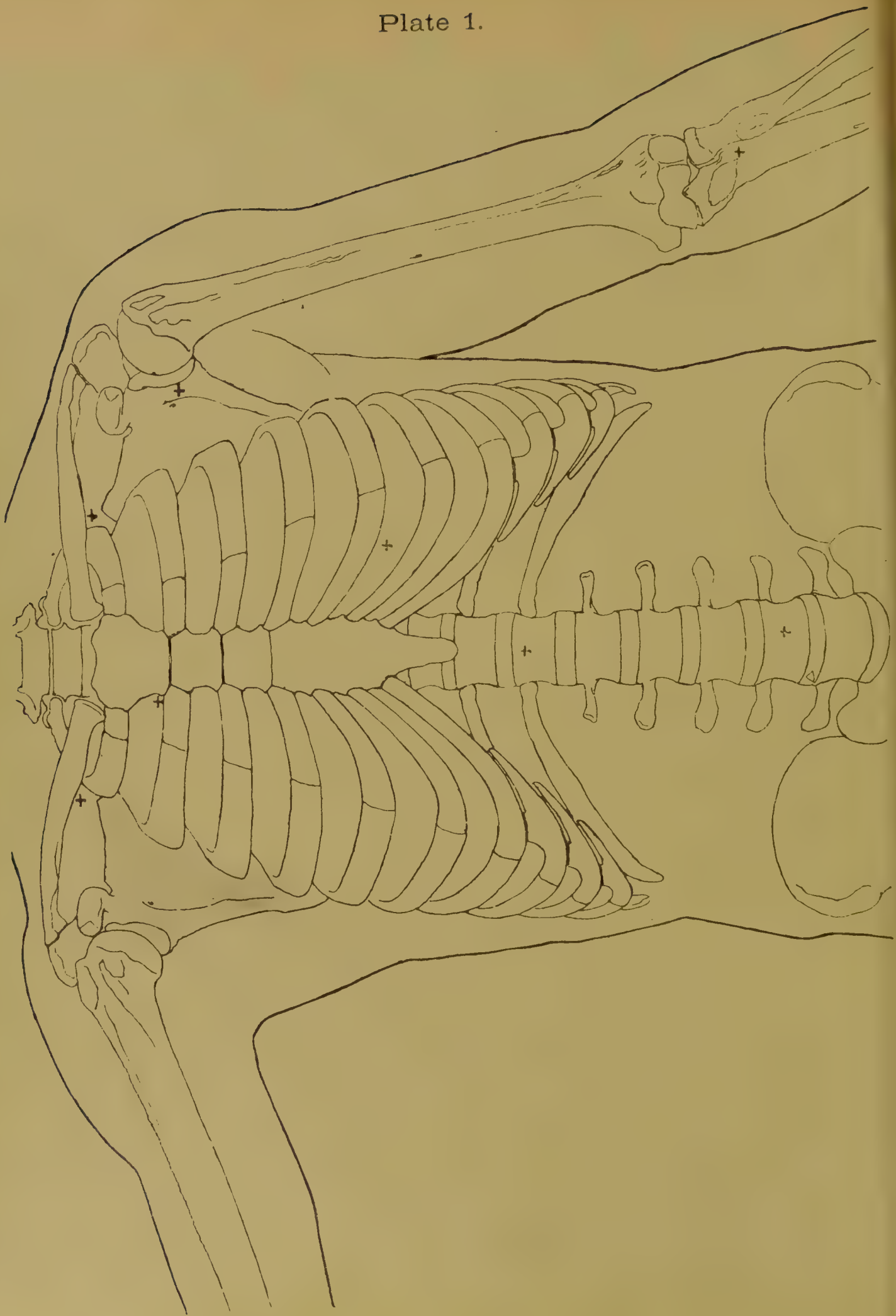


Plate 1.



FRONT VIEW OF TRUNK AND SHOULDER.

Right Side.

Muscles.

Pectoralis major.*
Pectoralis minor.
Intercostals.
Subscapularis.
Serratus magnus.
External oblique.
Latissimus Dorsi.
Teres major.
Subclavius.

Arteries.

Axillary.
- Superior thoracic.
- Acromio „
- Long „
- Alar „
- Subscapular.
- Anterior circumflex.
- Posterior „

Glands.

Axillary lymphatics.

Left Side.

Muscles.

Pectoralis major.
Pectoralis minor.
Subclavius.
Deltoid.
Biceps.
Coraco-brachialis.

Arteries.

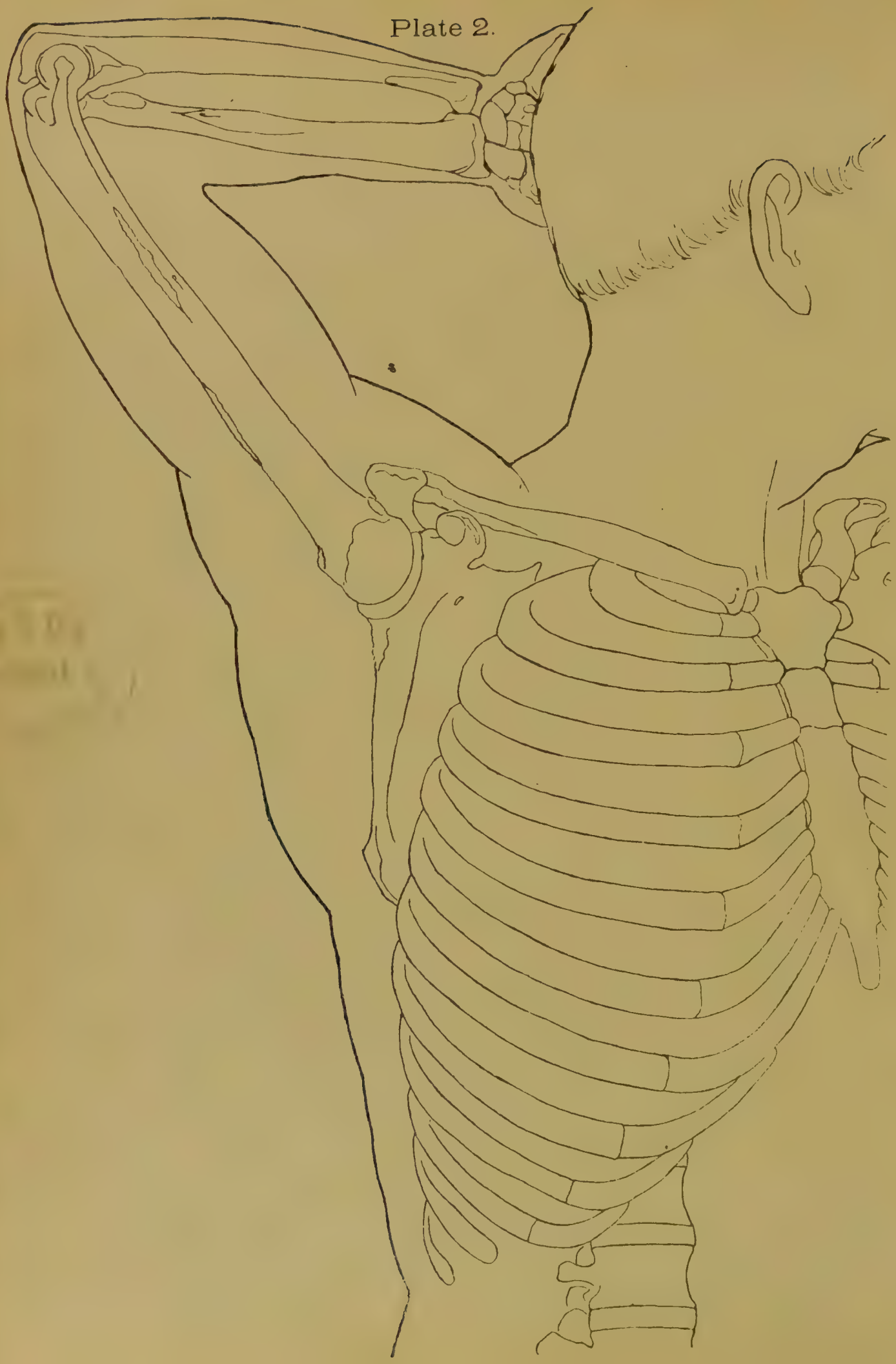
Perforating (internal mammary).
Humeral (Acromio-thoracic).

Vein.

Cephalic.

A + indicates the position of an *artery*—serving as a landmark. It is usually placed at its commencement or termination, or at some important point of its course. Δ is the sign for a *vein*, N for a *nerve*.

Plate 2.



AXILLA.

Right or Left I.

Muscles.

Pectoralis major.
Pectoralis minor (uncovered portion).
Serratus magnus.
Coraco-brachialis.
Biceps (short head).
Triceps.
Teres major.
Latissimus Dorsi.
Subscapularis.
External oblique.

Arteries.

Axillary.
- Long thoracic.
- Subscapular.
- Posterior circumflex.

Nerves.

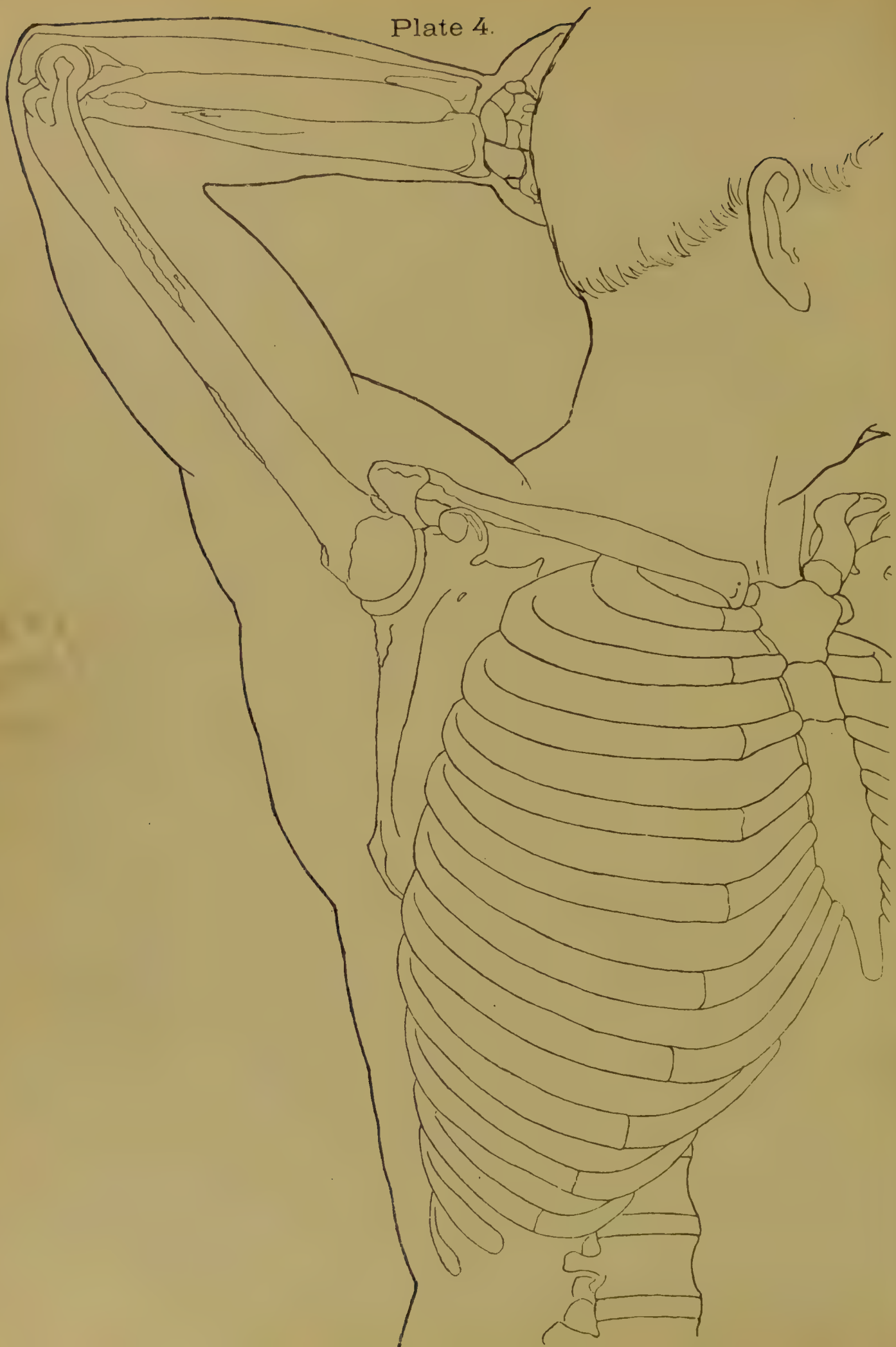
- Long subscapular (PC).
- External thoracic or Bell's (BP 5 and 6).

BP=Brachial plexus. PC=Posterior; IC=Internal; EC=External cord of brachial plexus.

Plate 3.



Plate 4.



AXILLA.

Right or Left II.

Muscles.

Pectoralis major.*
Pectoralis minor.*
Coraco-brachialis.
Biceps.
Subscapularis.
Teres major.
Serratus magnus.
External oblique.
Subclavius.

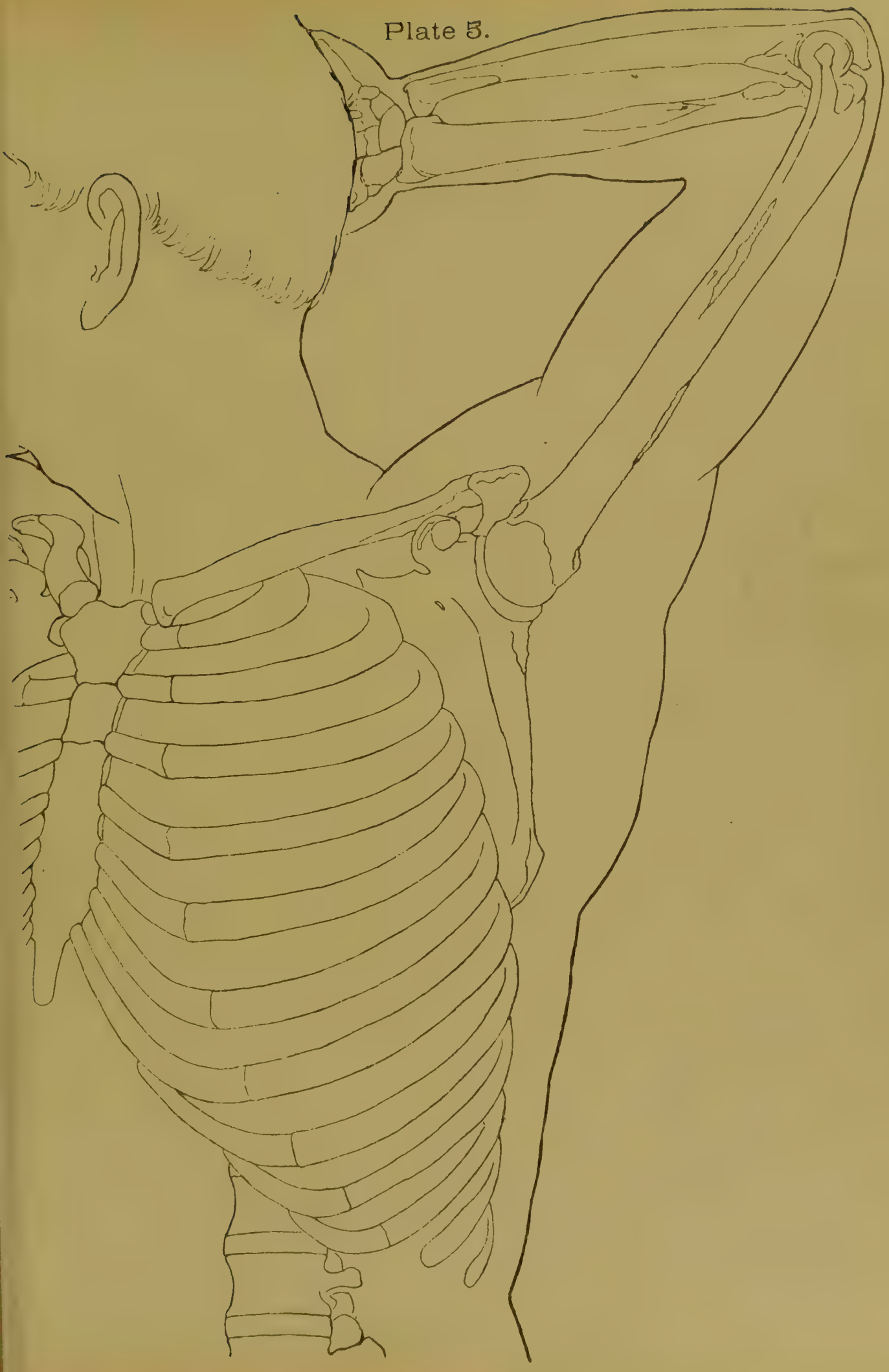
Arteries.

Axillary.
- Superior thoracic.
- Acromic thoracic
- Long „
- Alar „
- Subscapular.
- Anterior circumflex.
- Posterior circumflex.

Nerves.

Cords of Brachial plexus.
- Median nerve (IC—OC).
- Musculo-cutaneous (external cutaneous) OC.
- Ulnar (IC).
- Internal cutaneous (IC).
- Circumflex (PC).
- Lateral cutaneous (intercostals).

Plate 5.



FRONT VIEW OF TRUNK AND AXILLÆ.

Right.	Left.
Muscles.	*Muscles.*
Subscapularis.	Serratus magnus.
Teres major.	Subclavius.
Triceps.	Intercostals.
Biceps.	Coraco-brachialis.

Arteries.

Axillary.

Subscapular.

Dorsalis scapulæ (subscapular).

Plate 6.

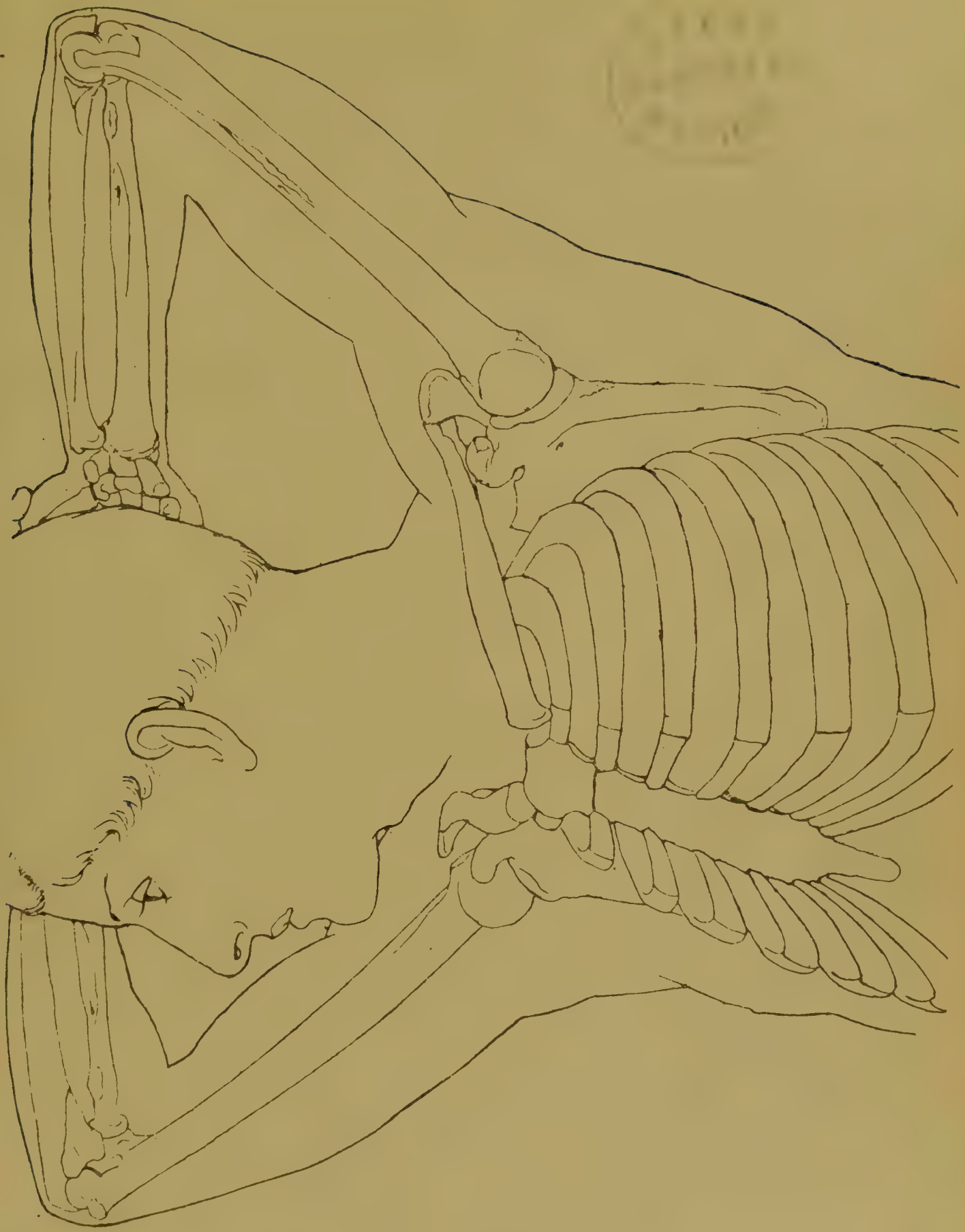
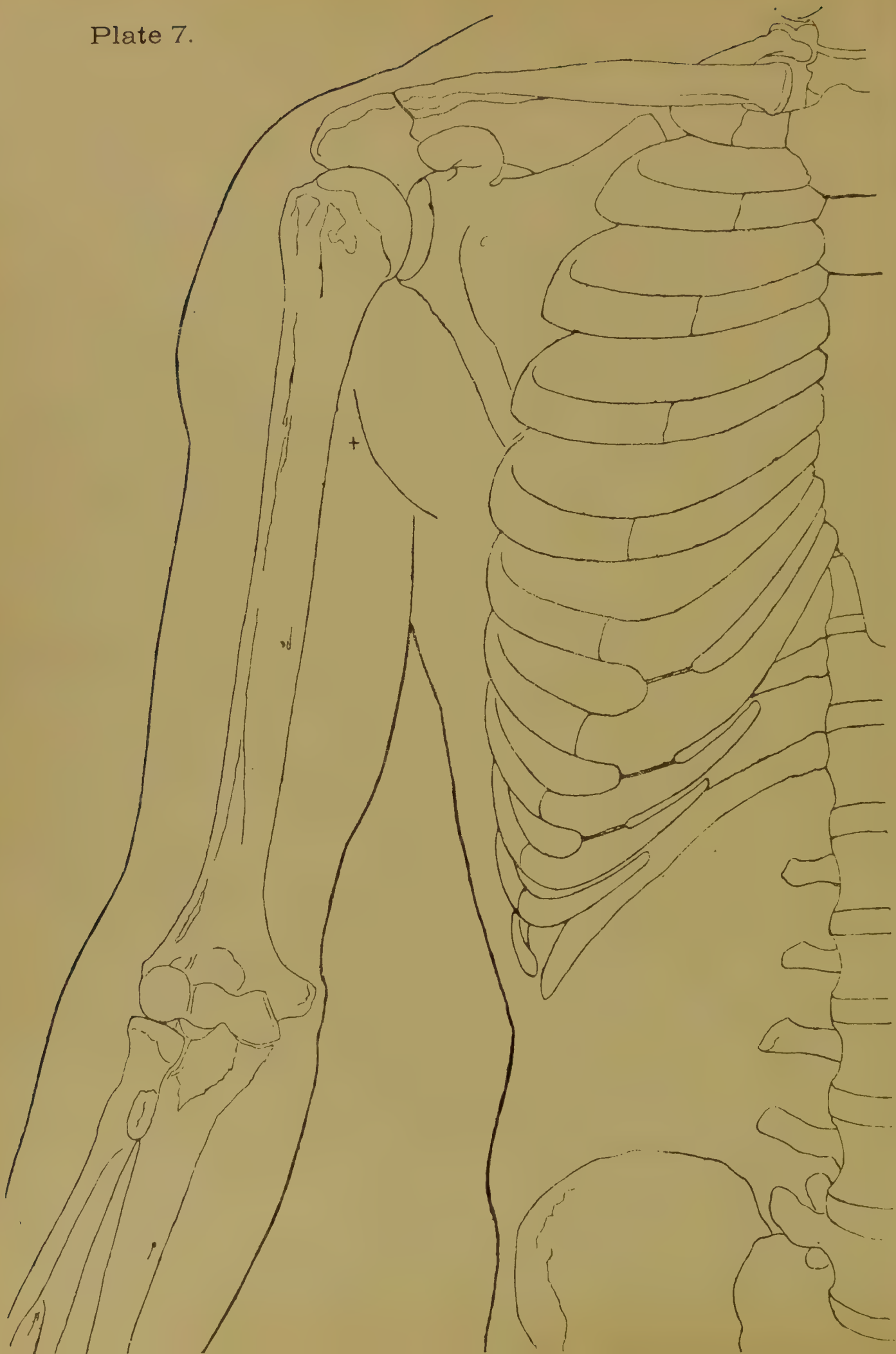


Plate 7.



FRONT VIEW OF UPPER ARM AND SHOULDER.

Right or Left I.

Muscles.

Bicipital fascia.
Pectoralis major.*
Pectoralis minor.*
Subclavius.
Deltoid.
Biceps.
Coraco-brachialis.
Brachialis anticus.
Triceps.
Latissimus Dorsi.
Subscapularis.
Teres major.
External oblique.
Intercostals.

Arteries.

Axillary.
- Subscapular.
- Circumflex.

Brachial.
- Superior profunda.
- Inferior „
- Nutrient.
- Anastamotica magna.
- Muscular.

Nerve.

Circumflex.

Note.—The position, number, and time at which the centres of ossification appear are indicated by figures. Those which appear *before birth* are shown by figures, in *italics*, and these denote the time in months, except when followed by a *W*, when *weeks* are intended. The *upright* figures denote *years*. The arrows → show the mode of union of these centres one with another, and the time this takes place is indicated by the figures between their points. The dotted arrows ⇢ show at what period the centre unites with the shaft of the bone. The average time at which these changes occur has been chosen.

Plate 8.

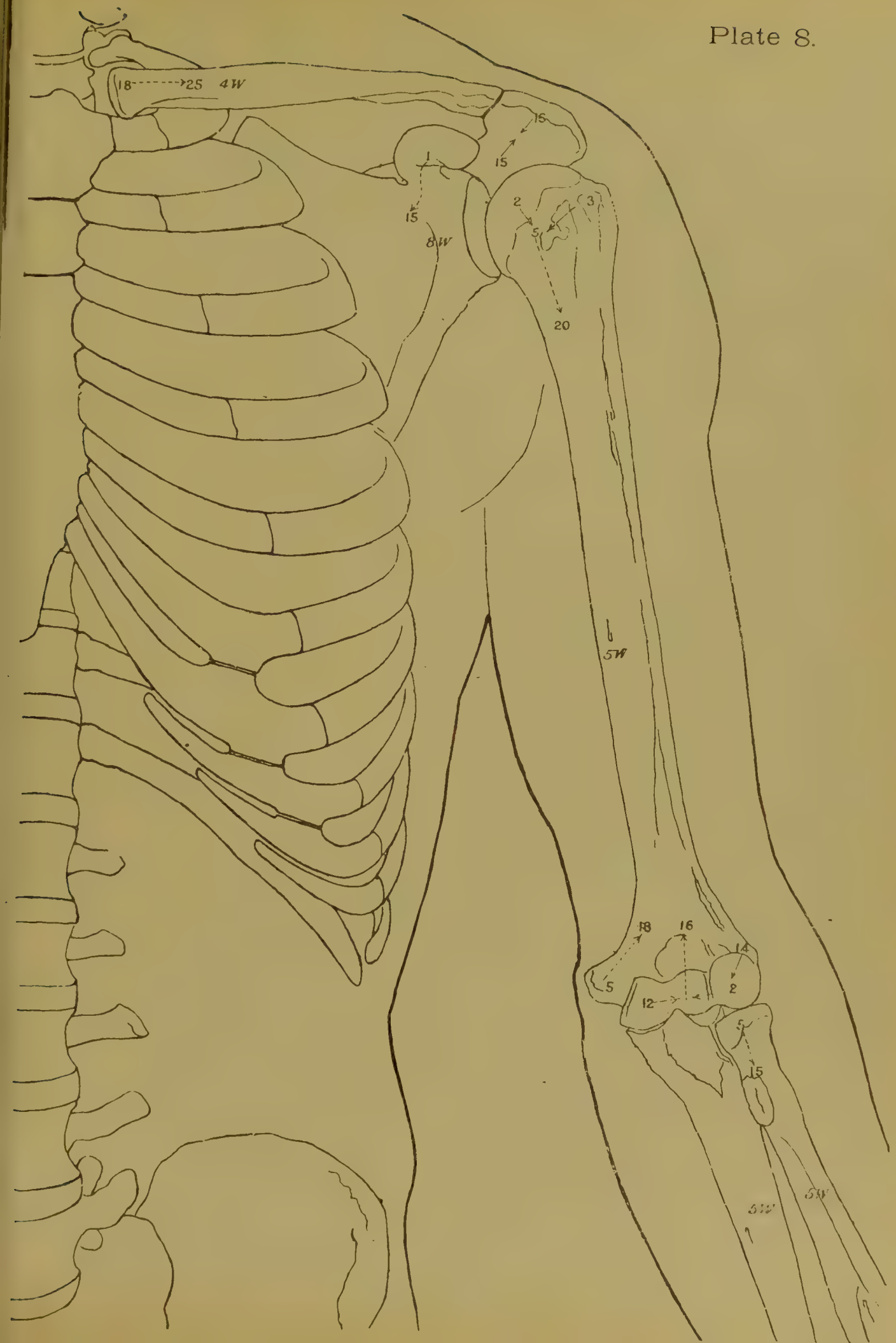
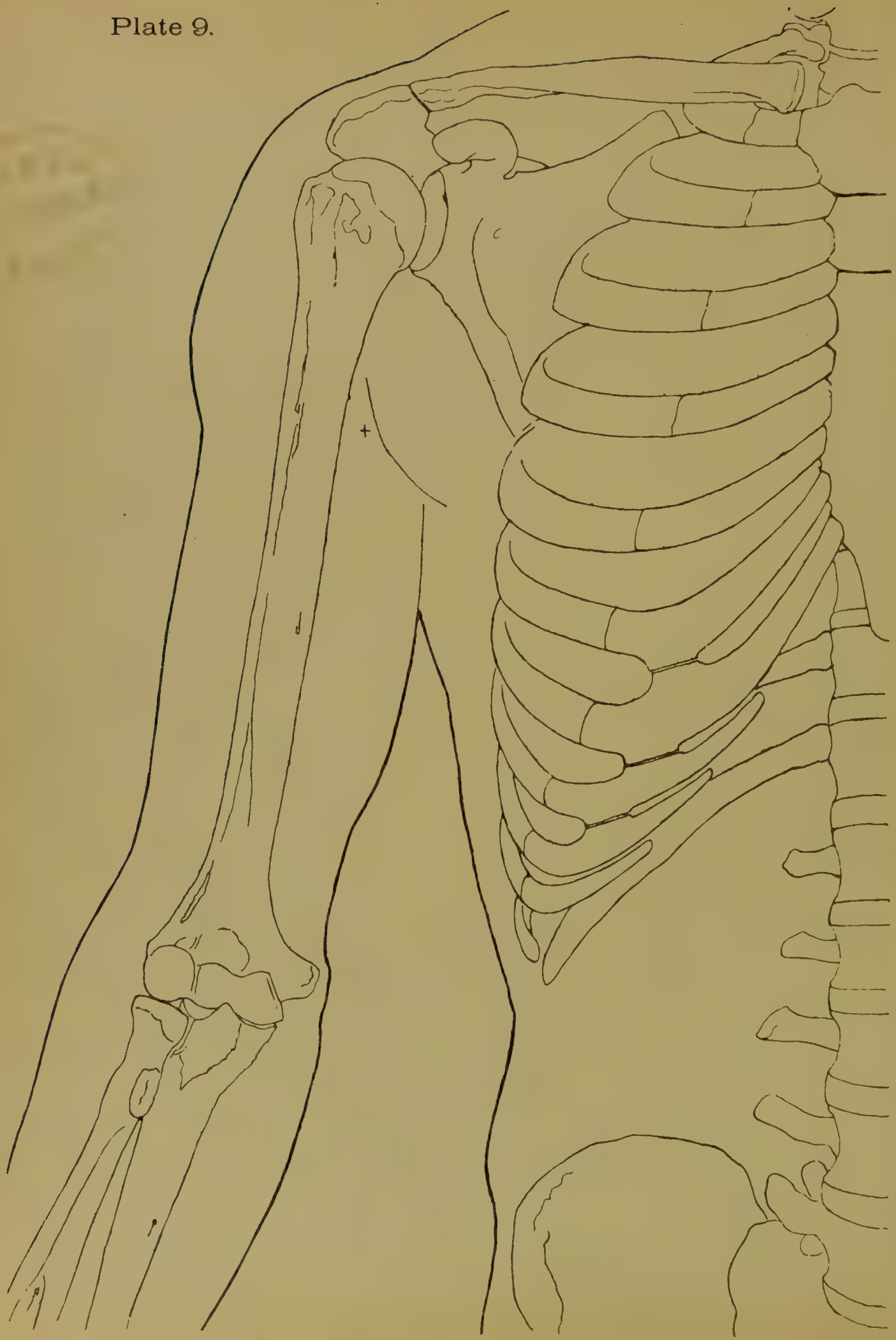


Plate 9.



FRONT VIEW OF UPPER ARM AND SHOULDER.

RIGHT OR LEFT II.

Muscles.

Deltoid.*
Subscapularis.
Serratus magnus.
Intercostals.
Brachialis anticus.
Triceps.

Arteries.

Axillary.
  Anterior circumflex
Brachial.

Nerves.

Brachial plexus.
  Median (IC—OC).
  Internal cutaneous (IC).
  Ulnar (IC).
  External cutaneous (EC).
  Musculo-spiral (PC).

Plate 10.

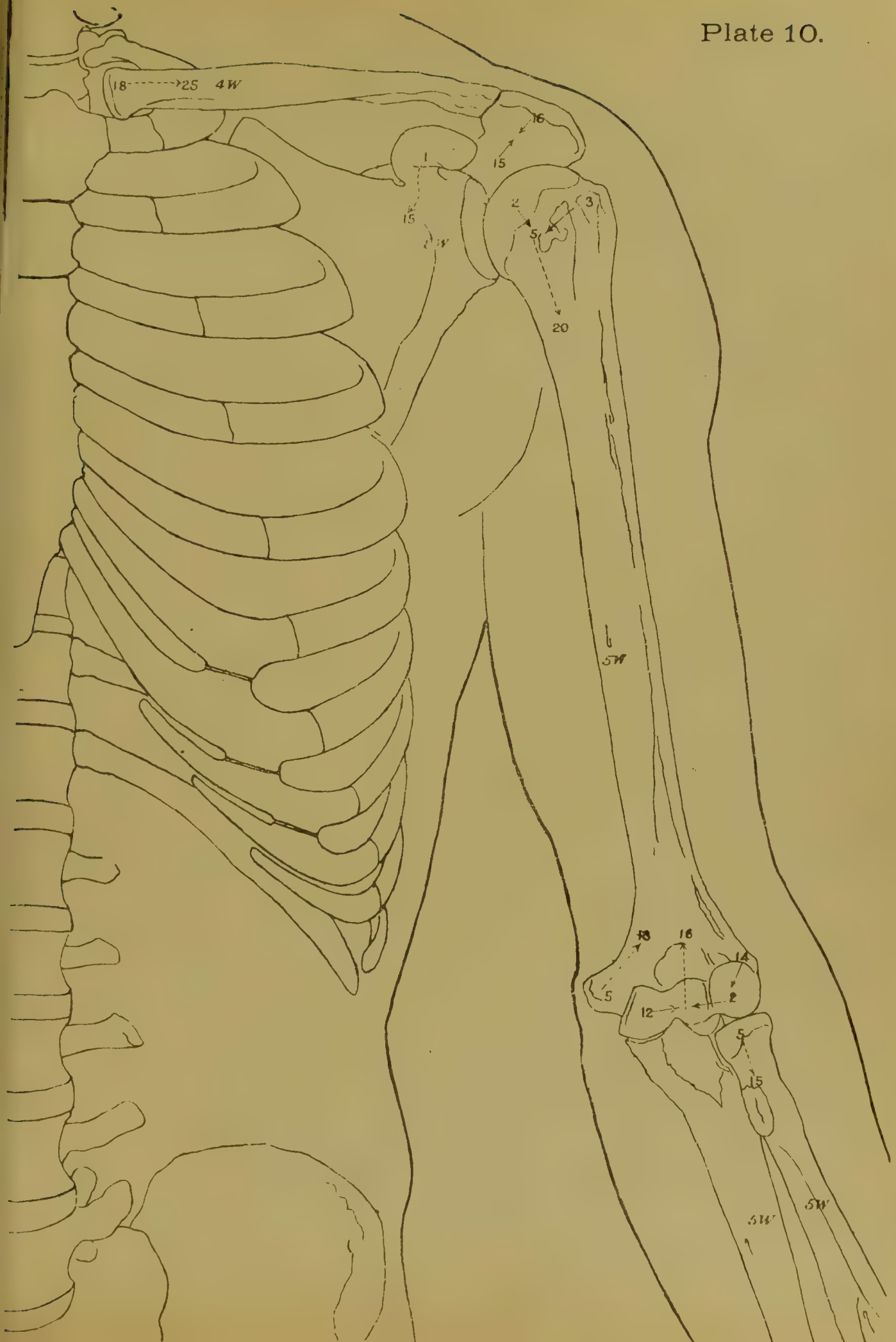
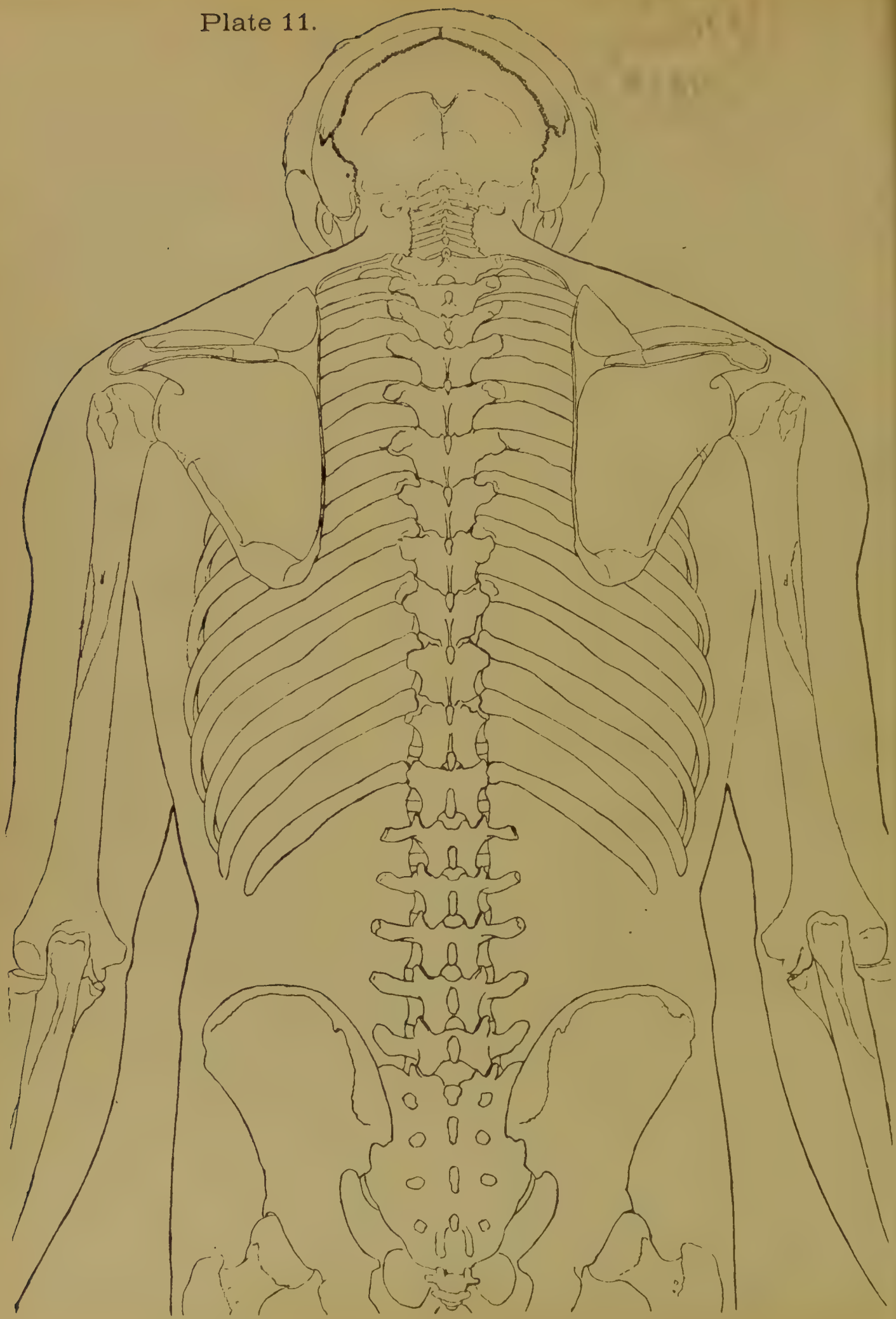


Plate 11.



BACK VIEW OF TRUNK AND SHOULDER.

Right Side.

Muscles.

Trapezius.
Latissimus dorsi.
Supra spinatus.
Infra spinatus.
Teres major.
Teres minor.
Deltoid.
Levator anguli scapulæ.
Rhomboideus minor.
Rhomboideus major.
Serratus posticus inferior.

Left Side.

Muscles.

Trapezius.
Teres major.
Teres minor.
Triceps (long head).
Serratus posticus inferior.
Serratus posticus superior.
Serratus magnus.

Arteries.

Supra scapular (thyroid axis).
Subscapular (axillary).
Dorsalis scapulæ (sub-scapular).
Posterior scapular (thyroid axis).
Posterior circumflex (axillary).

Nerves.

Cervical cutaneous.
Dorsal ,,
Lumbar ,,

Plate 12.



BACK VIEW OF UPPER ARM AND SHOULDER.

RIGHT OR LEFT.

Muscles.

Teres minor.
Teres major.
Triceps.
Anconeus.
Supinator longus.
Rhomboideus minor.*
Rhomboideus major.*
Levator anguli scapulæ.*
Deltoid.*
Serratus posticus inferior.*

Arteries.

Supra scapular (thyroid axis).
Dorsalis scapulæ (subscapular).
Posterior circumflex (axillary).

BACK VIEW OF UPPER ARM AND SHOULDER.

RIGHT OR LEFT.

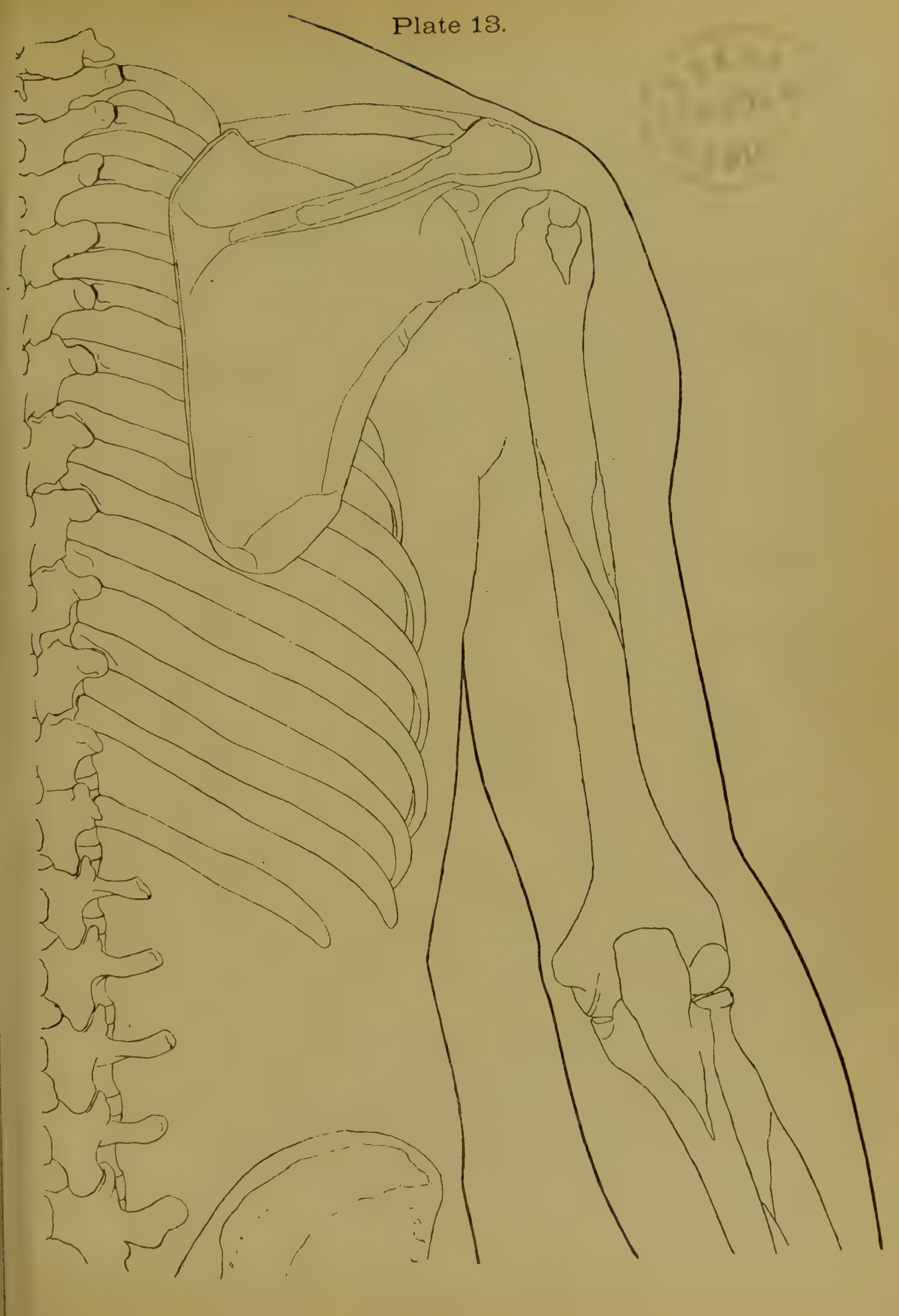
Muscles.

Teres minor.
Teres major.
Triceps.
Anconeus.
Supinator longus.
Rhomboideus minor.*
Rhomboideus major.*
Levator anguli scapulæ.*
Deltoid.*
Serratus posticus inferior.*

Arteries.

Supra scapular (thyroid axis).
Dorsalis scapulæ (subscapular).
Posterior circumflex (axillary).

Plate 13.



FRONT VIEW OF ELBOW.

RIGHT OR LEFT.

I.

Muscles.

Deep fascia.
Bicipital fascia.

Veins.

Basilic.
Cephalic.
Median basilic.
Median cephalic
Ulnar.
Radial.
Median.
Communicating.

Nerves.

Internal cutaneous (IC).
External cutaneous EC).

II.

Muscles.

Supinator longus.
Biceps.
Brachialis anticus.
Pronator radii teres.
Flexor carpi radialis.
Palmaris longus.
Flexor carpi ulnaris.
Supinator brevis.

Arteries.

Brachial.
Anastamotica magna.
Radial.
Recurrent.
Ulnar.

Vein.

Brachial.

Nerve.

Median.

Plate 14.

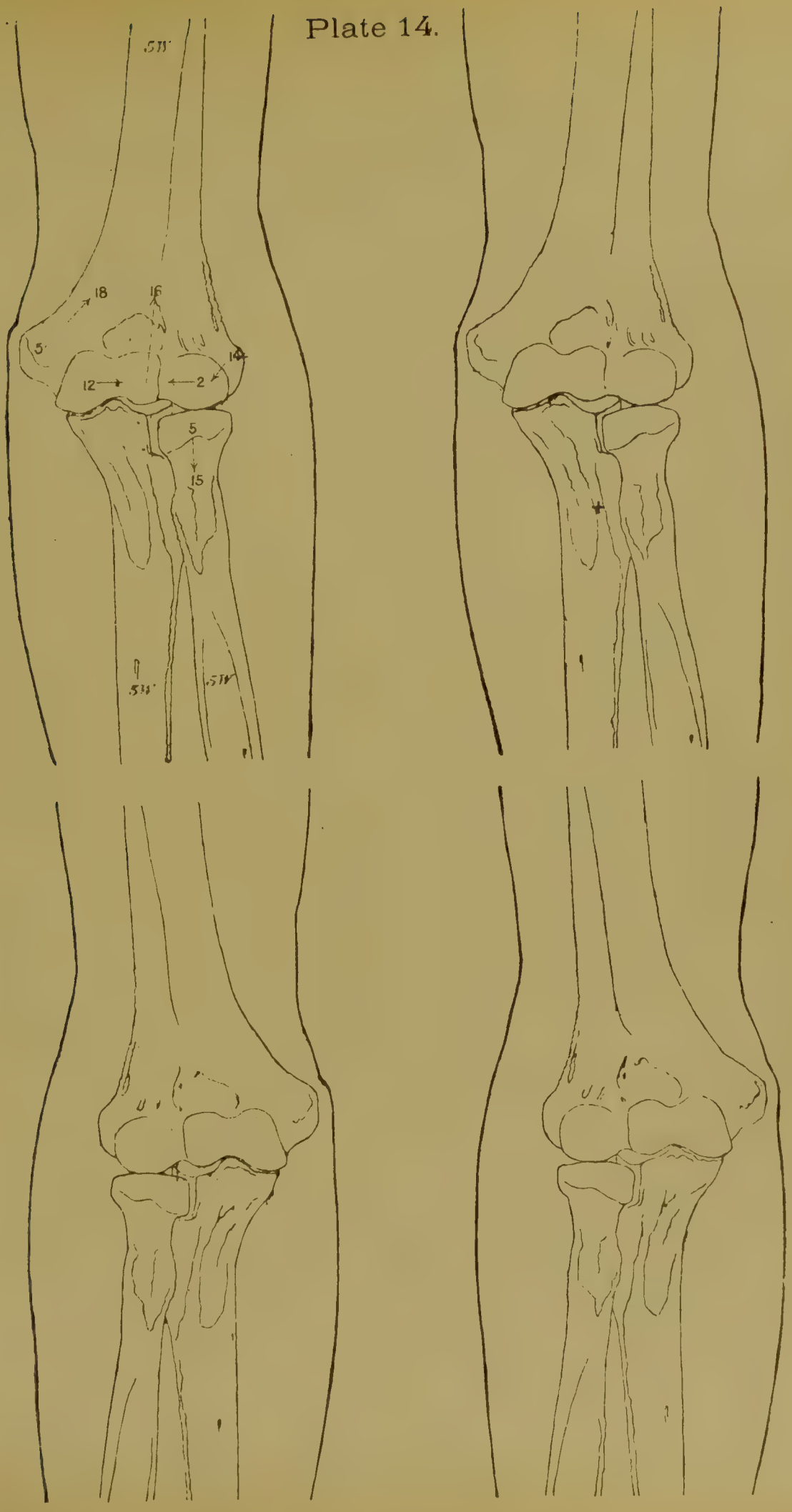
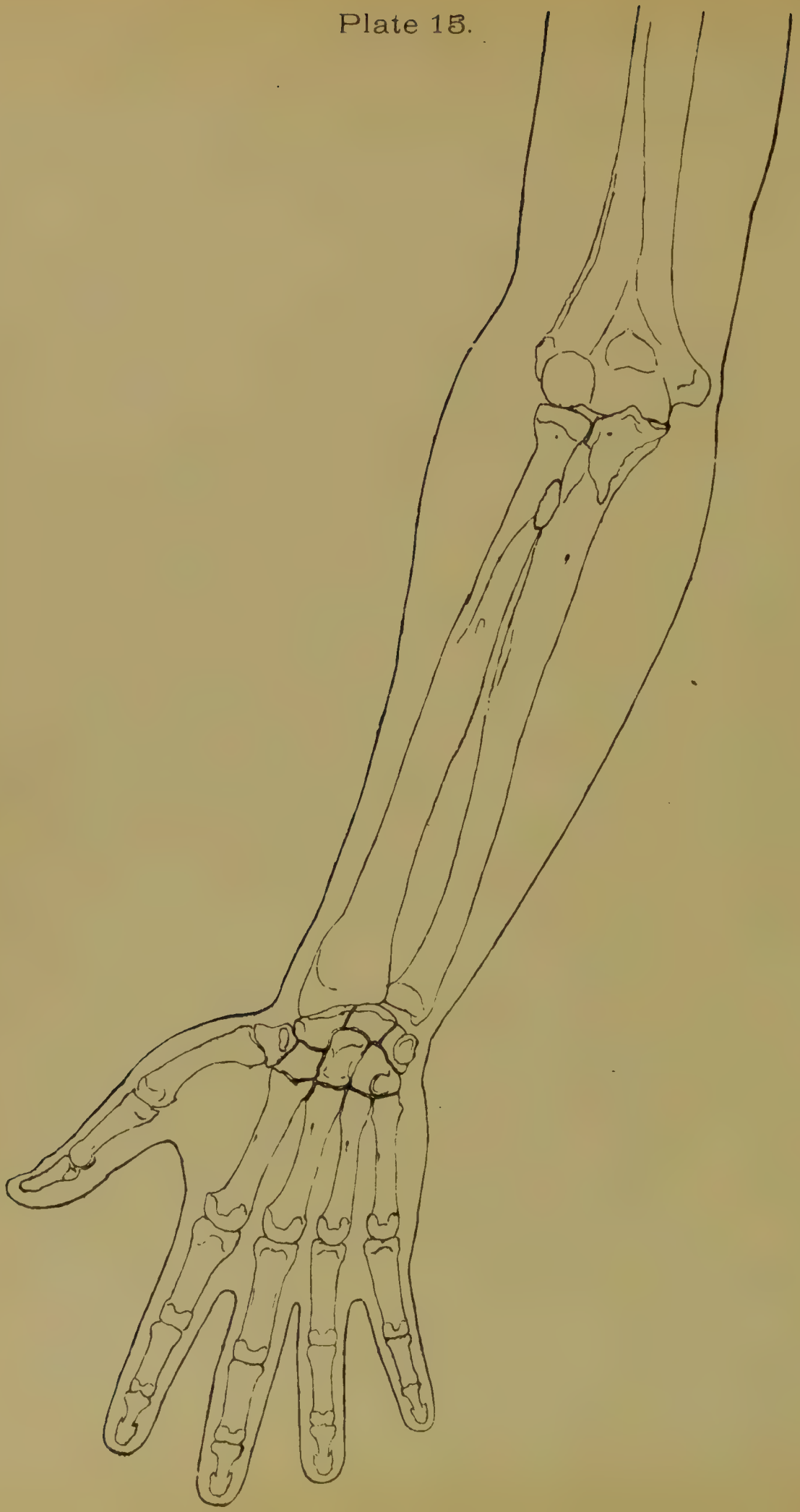


Plate 15.



FRONT VIEW OF FORE ARM AND HAND.

RIGHT OR LEFT I.

Muscles.

Brachialis anticus.
Supinator longus.
Supinator brevis.
Flexor carpi radialis.
Pulmaris longus.
Flexor carpi radialis.
Flexor carpi ulnaris.
Pronator quadratus.
Lumbricales.
Palmaris brevis.

Arteries.

Brachial.
Radial.
Ulnar.

Ligaments.

Anterior annular.
Palmar fascia.

Plate 16.

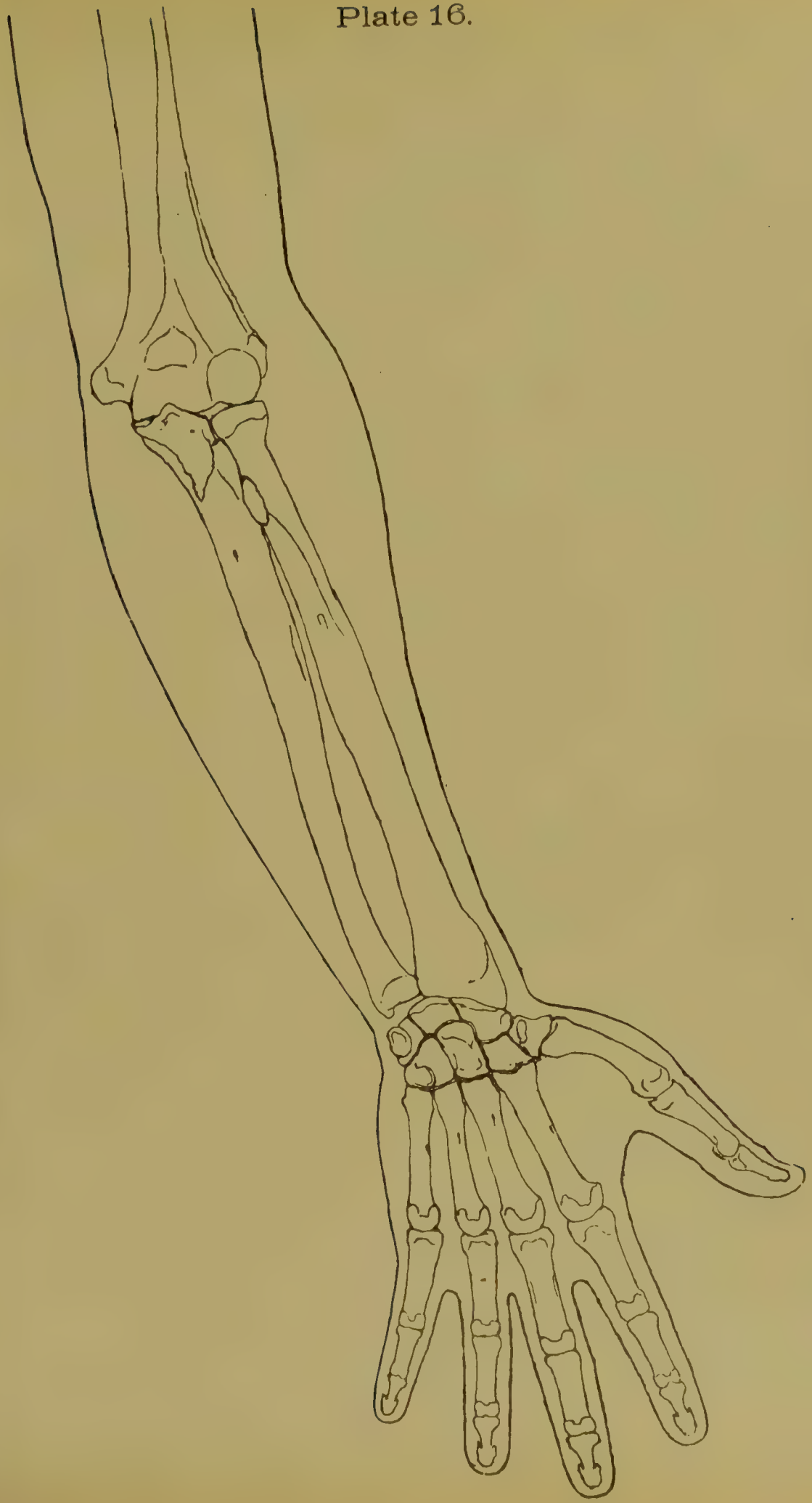


Plate 17.



FRONT VIEW OF FORE ARM AND HAND.

RIGHT OR LEFT II.

Muscles.

Brachialis anticus.
Supinator longus.*
Extensor carpi radialis longior.
Supinator brevis.
Flexor sublimis digitorum.
Flexor longus pollicis.
Pronator quadratus.
Abductor pollicis.
Opponens pollicis.
Abductor minimi digiti.

Arteries.

Brachial.
Radial.
- Recurrent.
- Superficialis volæ.

Ulnar.
- Anterior recurrent.
- Communicating.
- Superficial palmar arch.
- Digital.

Ligament.

Anterior annular.

Plate 18.



Plate 19.



FRONT VIEW OF FORE ARM AND HAND.

RIGHT OR LEFT III.

Muscles.

Brachialis anticus.
Supinator brevis.
Flexor sublimis digitorum.
Pronator radii teres.*
Flexor longus pollicis.
Flexor profundus digitorum.
Pronator quadratus.
Adductor pollicis.
Abductor pollicis.
Lumbricales.
Flexor brevis minimi digiti.

Arteries.

Brachial.
Radial.
- Recurrent.
- Superficial volar.

Ulnar.
- Recurrent.
- Common interosseous.
- Anterior „

Nerves.

Median.
- Anterior interosseous.
- Digital.

Ulnar.
- Digital.

Musculo-spiral.
- Radial.
- Posterior interosseous.

Plate 20.

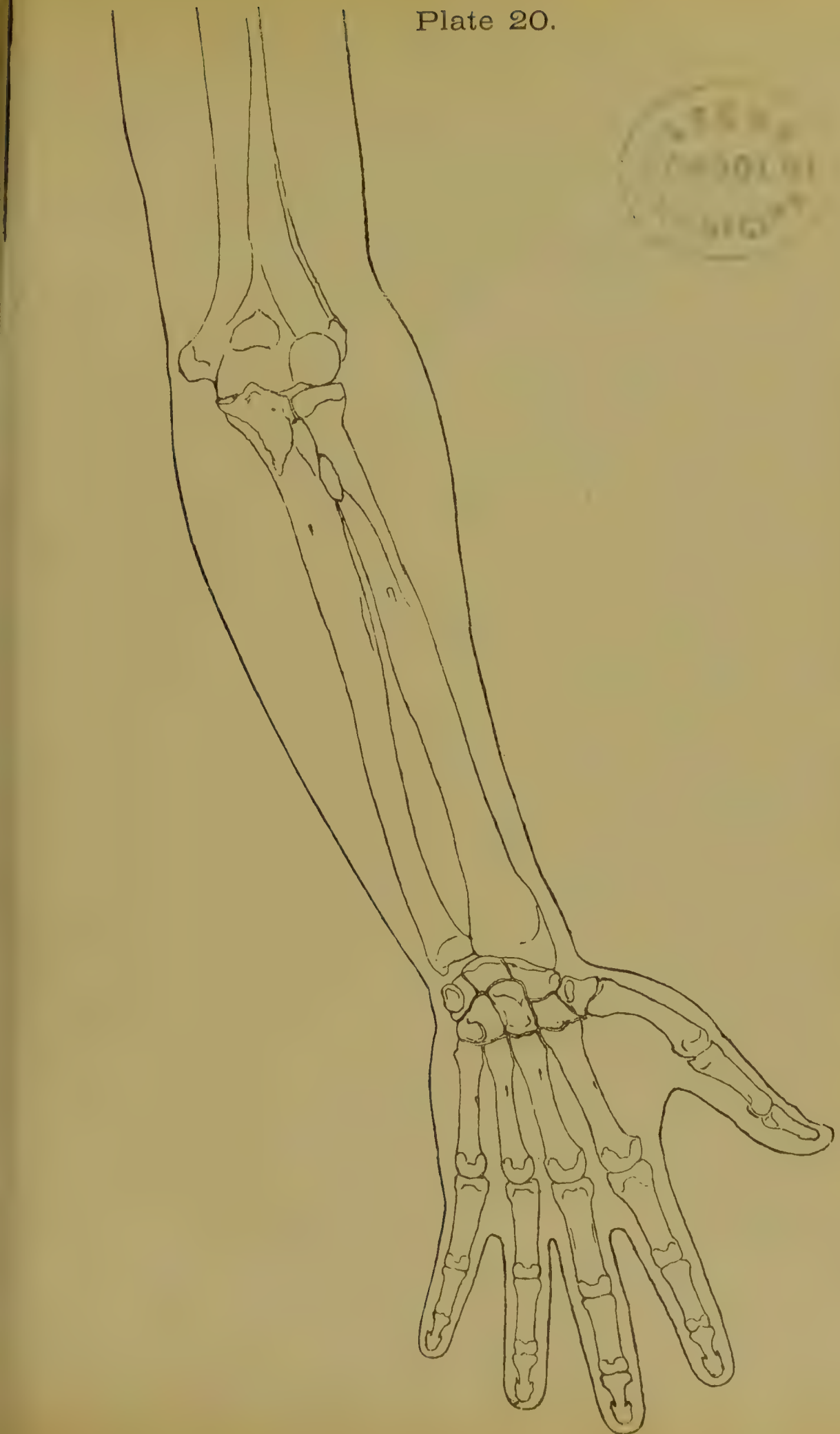
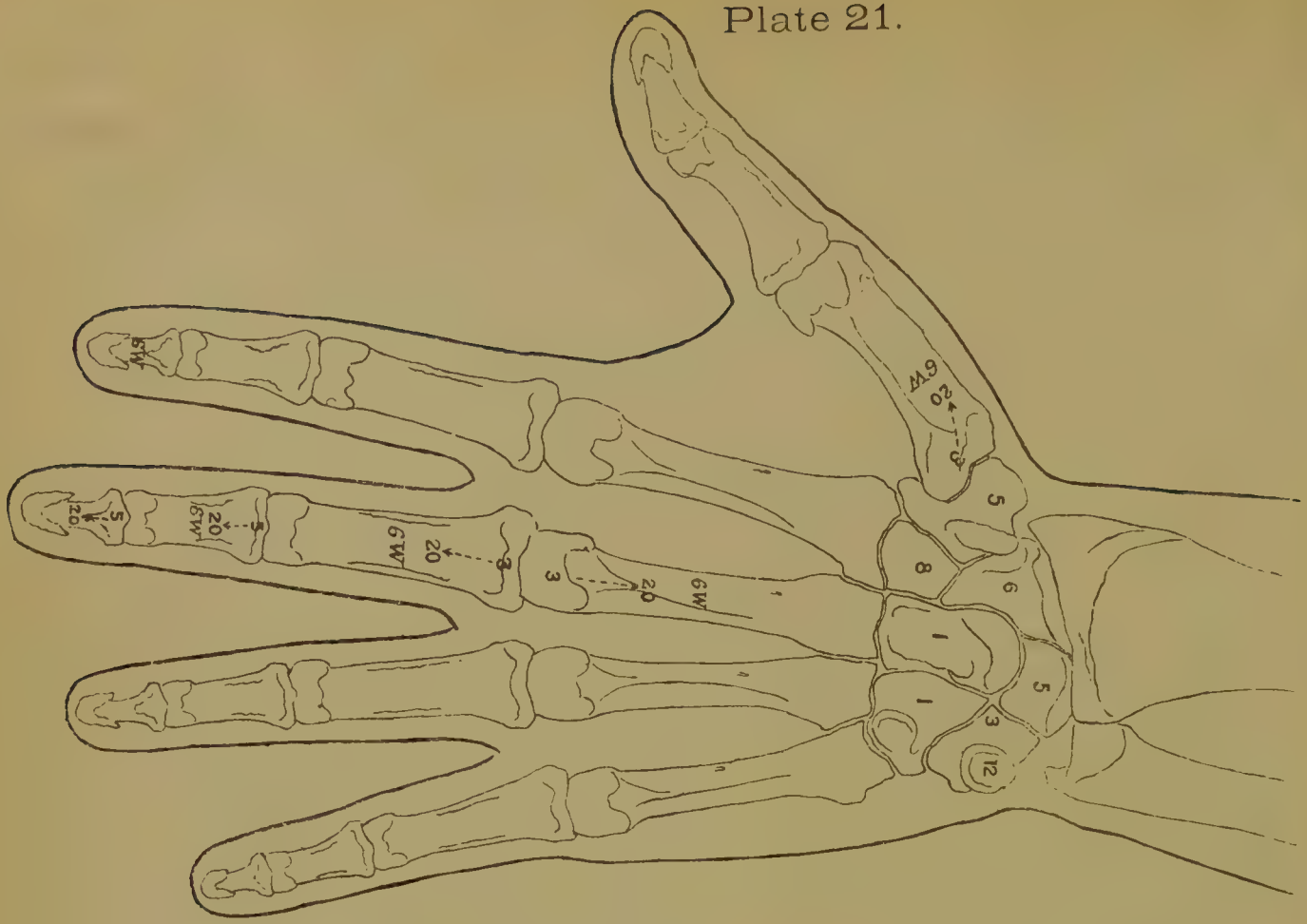
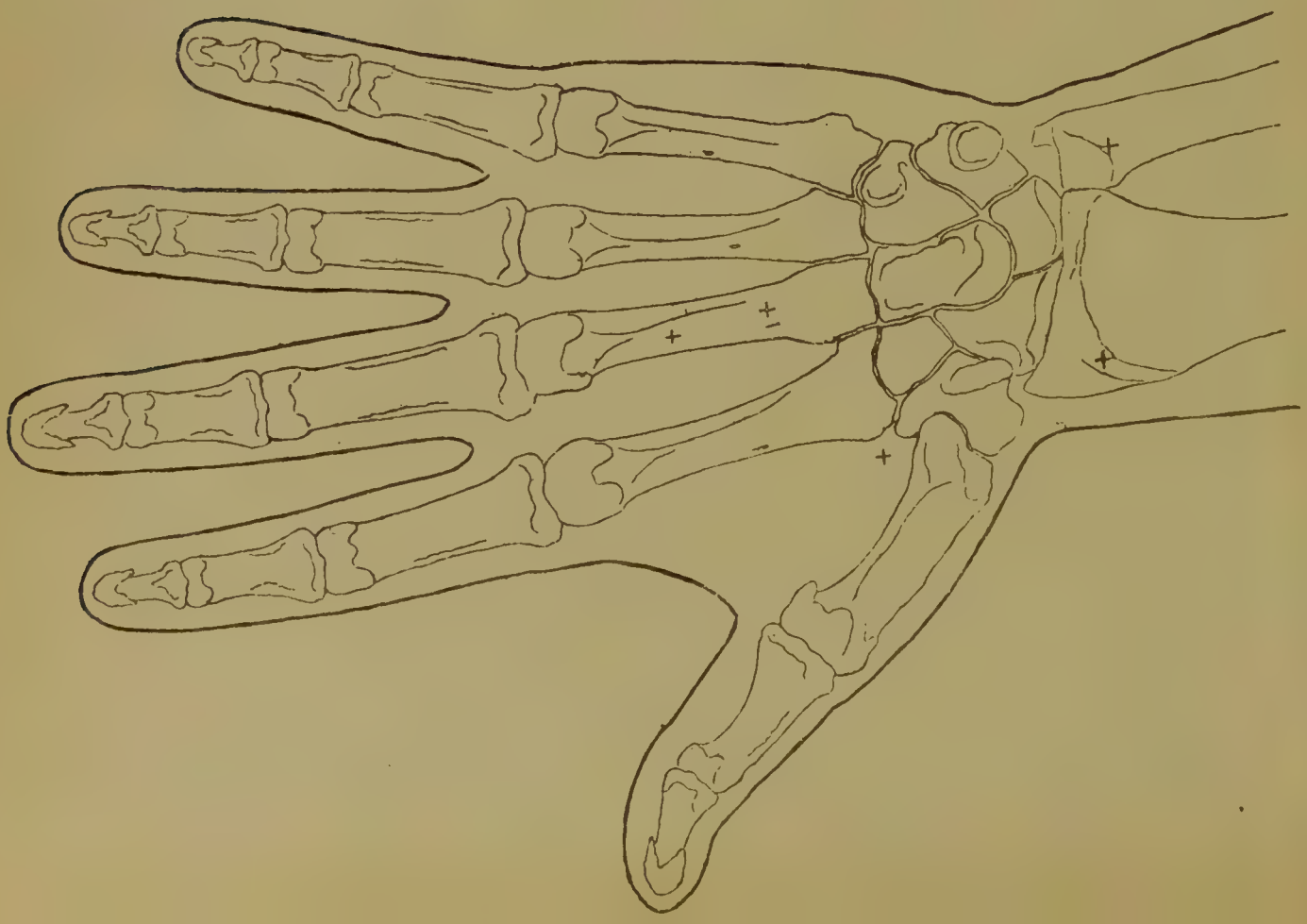


Plate 21.





PALM OF HAND AND WRIST.

RIGHT OR LEFT I.

Muscles.

Abductor pollicis.
Opponens pollicis (Flexor ossis metacarpi pollicis).
Flexor brevis pollicis (inner head).*
Adductor pollicis.
Abductor indicis (first dorsal interosseous).
Interossei (palmar).
Abductor minimi digiti.
Flexor brevis minimi digiti.
Flexor carpi ulnaris.
Supinator longus.
Flexor sublimis digitorum (digital portions of tendons).
Flexor profundus digitorum (digital portions of tendons).
Pronator quadratus.

Arteries.

Ulnar.
- Anterior carpal.
- Communicating.
- Digital.

Radial.
- Superficial volar.
- Anterior carpal.
- Princeps pollicis.
- Radialis indicis.
- Deep palmar arch.
- Perforating.
- Interosseous.

Ligaments.

Anterior annular.
Sheath for flexor tendons.

PALM OF HAND AND WRIST.

RIGHT OR LEFT II.

Muscles.

Opponens minimi digiti.
Flexor brevis pollicis.
Flexor longus pollicis.
Flexor carpi ulnaris.
Flexor carpi radialis.
Pronator quadratus.*
Flexor profundus (tendons below wrist).
Lumbricales.

Arteries.

Branch of anterior interosseous.
Anterior carpal (radial).
Anterior carpal (ulnar).

Ligament.

Interosseous.

Plate 22.

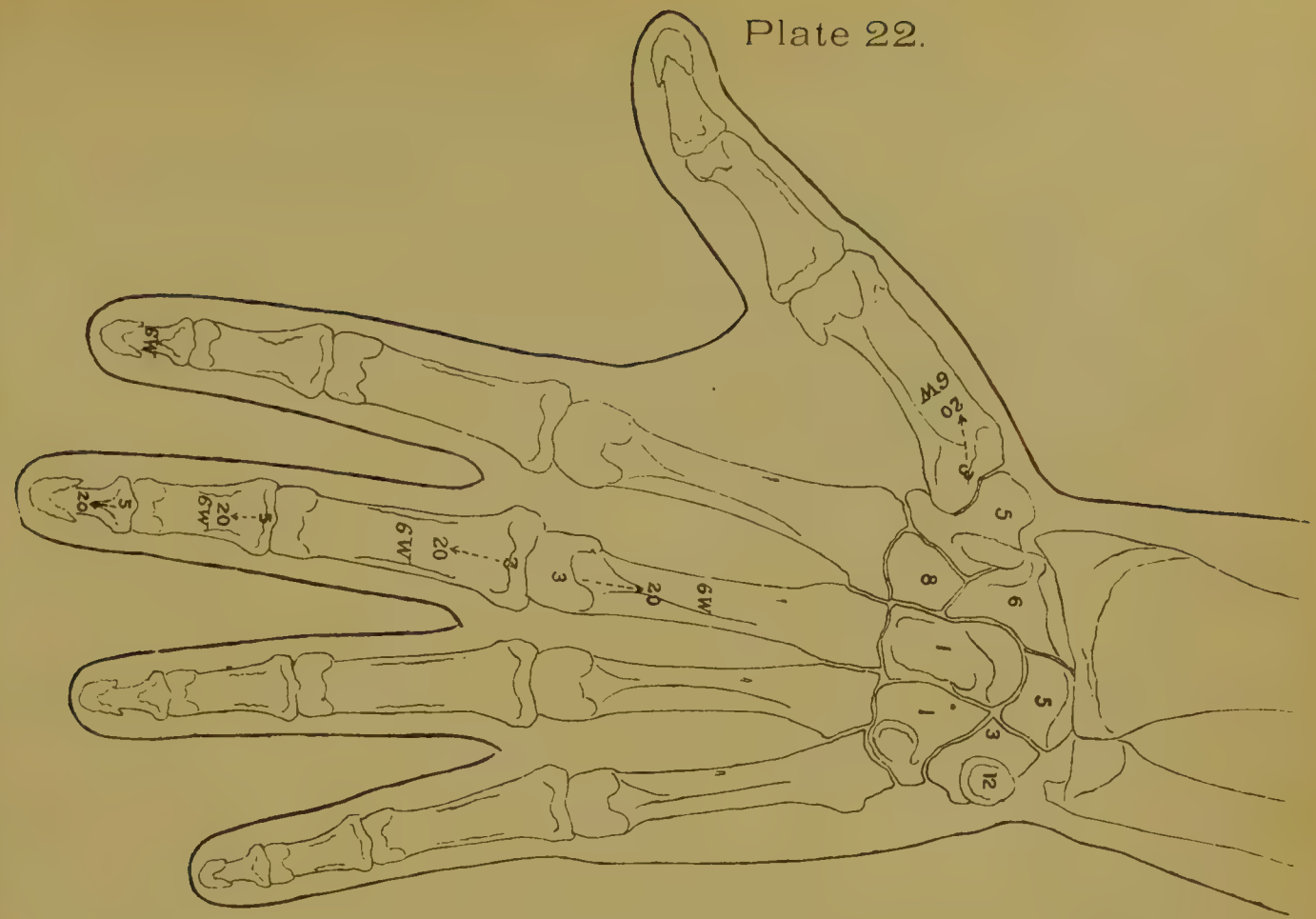




Plate 23.



BACK VIEW OF FORE ARM AND HAND.

RIGHT OR LEFT I.

Muscles.

Triceps.
Anconeus.
Supinator longus.
Extensor carpi radialis longior.
Extensor carpi radialis brevior.
Extensor communis digitorum.
Extensor carpi ulnaris.
Abductor indicis.
Abductor minimi digiti.

Nerves.

Radial.
Ulnar.

Ligament.

Posterior annular ligament.

Plate 24.



Plate 25.



BACK VIEW OF FORE ARM AND HAND.

—+—

Right or Left II.

Muscles.

Anconeus.*
Triceps.*
Supinator brevis.
Extensor ossis metacarpi pollicis.
Extensor primi internodii pollicis.
Extensor secundi internodii pollicis.
Flexor carpi ulnaris.
Dorsal interossei.

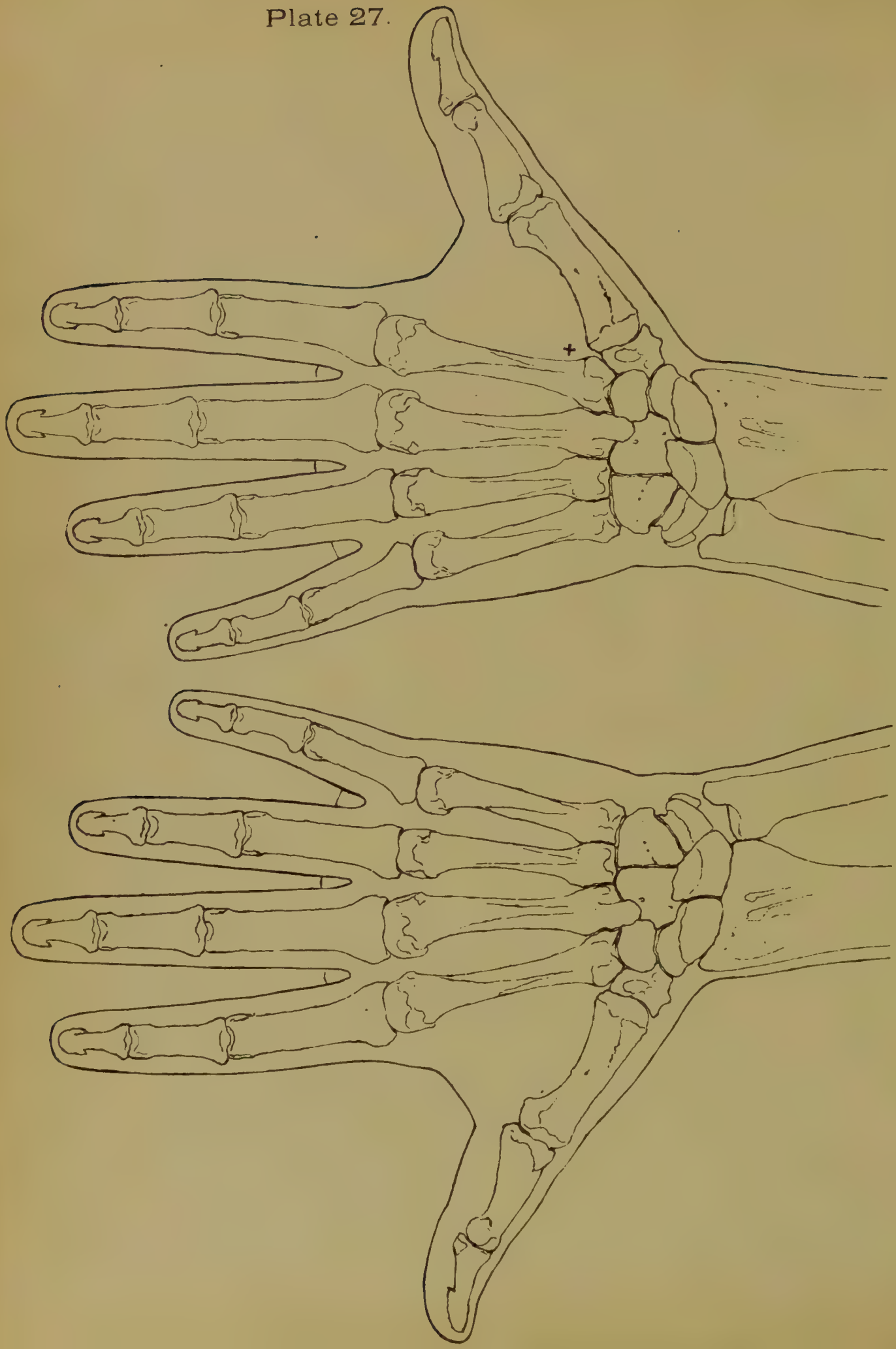
Arteries.

Posterior ulnar recurrent.
Anastamotica magna (brachial).
Superior profunda (brachial).
Posterior interosseous (interosseous of ulnar).
Recurrent.
Anterior interosseous (interosseous of ulnar).
Posterior carpal (ulnar).
Radial.
Posterior carpal.
Dorsalis pollicis.
Dorsalis indicis.

Plate 26.



Plate 27.



BACK VIEW OF HAND AND WRIST.

RIGHT OR LEFT.

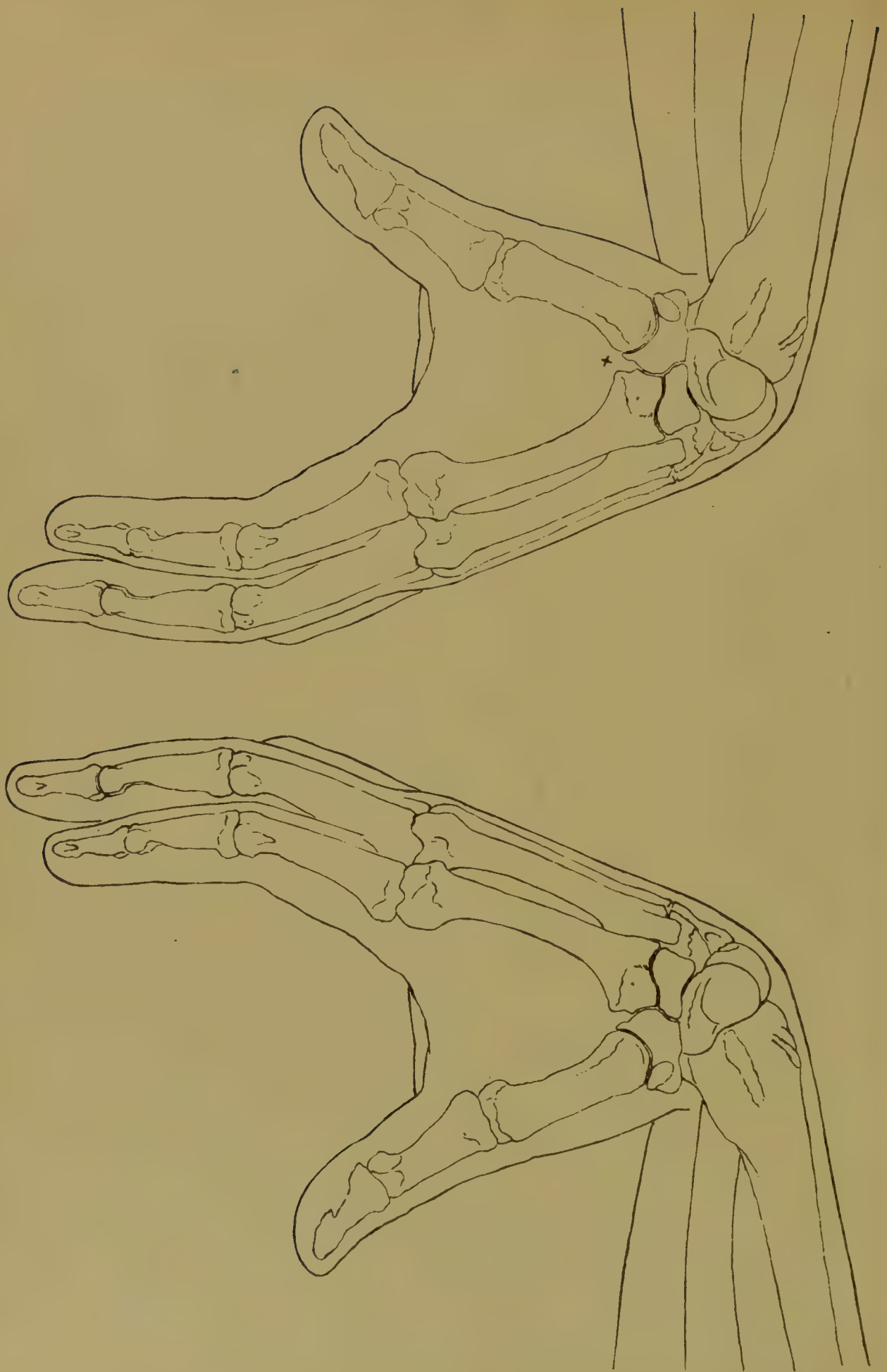
Extensor carpi radialis longior.
Extensor carpi radialis brevior.
Extensor ossis metacarpi pollicis.
Extensor secundi internodii pollicis.
Extensor primi internodii pollicis.
Extensor carpi ulnaris.
Interossei (dorsal).
Adductor pollicis.
Opponens minimi digiti.

Arteries.

Radial.
- Dorsalis pollicis.
- Dorsalis indicis.
- Posterior carpal.
- Interosseous.

Posterior carpal (ulnar).
Anterior interosseous (interosseous of ulnar).

Plate 28.



OUTSIDE VIEW OF HAND AND WRIST.

RIGHT OR LEFT.

Muscles.

Extensor secundi internodii pollicis.
Extensor carpi radialis longior.
Extensor carpi radialis brevior.
Extensor ossis metacarpi pollicis.
Abductor indicis (first dorsal interosseous).
Second dorsal interosseous.
Supinator longus.
Pronator quadratus.

Arteries.

Radial.
- Posterior carpal.
- Metacarpal.
- Dorsales pollicis.
- Dorsalis indicis.

Nerves.

- Radial (musculo-spiral).
- Musculo-cutaneous (EC).

LIGAMENTS OF STERNUM, CLAVICLE AND SHOULDER.

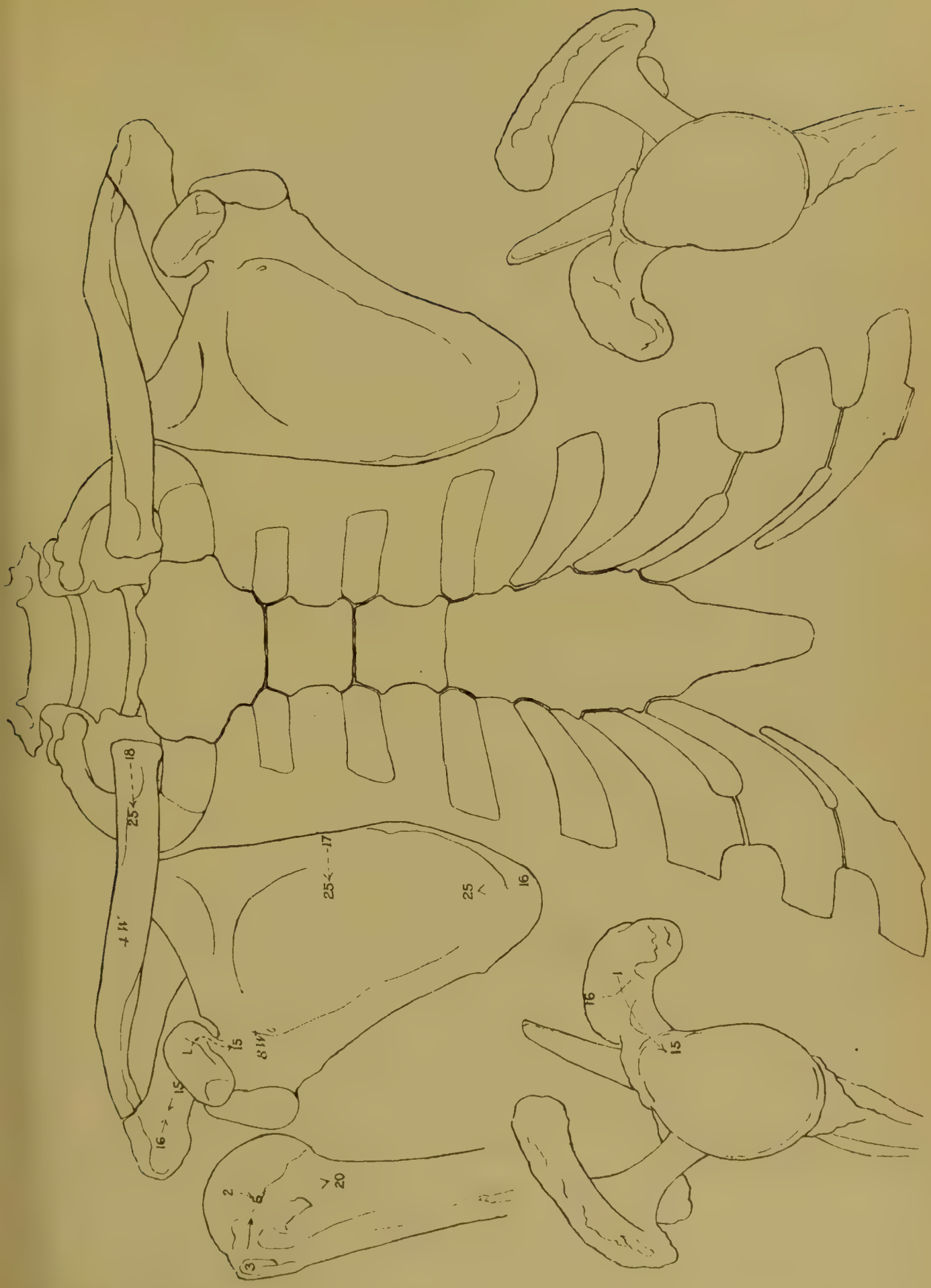
RIGHT SIDE.

Anterior costo-sternal.
Costo-xiphoid.
Intercostal.
Inter-clavicular.
Anterior sterno-clavicular.
Rhomboidal (costo-clavicular.)
Suprascapular (transverse).
Capsular.
Coraco-humeral.
Tendon of biceps.
Coraco-acromical.
Tendon of triceps.
Tendon of subscapularis.

LEFT SIDE.

Interarticular.
Capsular.
Interarticular fibro-cartilage
Conoid.
Trapezoid.
Coraco-acromial.
Glenoid.
Tendon of biceps.

Plate 29.



LIGAMENTS OF ELBOW AND SUPERIOR RADIO-ULNAR JOINT.

Elbow.

Anterior.

Posterior.

External lateral.

Internal lateral.

Anterior portion.

Posterior portion.

Radius and Ulnar.

Orbicular.

Oblique.

Interosseous membrane.

Plate 30.



Plate 31.



LIGAMENTS OF WRIST AND INFERIOR RADIO-ULNAR JOINT.

Radius and Ulnar.

Anterior radio-ulnar.
Posterior radio-ulnar.
Triangular fibro-cartilage.

Wrist.

External lateral.
Internal lateral.
Anterior.
Posterior.

ANATOMICAL OUTLINES

PART II

LONDON : PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
AND PARLIAMENT STREET

ANATOMICAL OUTLINES

FOR THE USE OF STUDENTS IN THE DISSECTING ROOM

AND SURGICAL CLASS ROOM



BY

ARTHUR HENSMAN

SENIOR DEMONSTRATOR OF ANATOMY AT THE MIDDLESEX HOSPITAL

WITH ORIGINAL DRAWINGS by ARTHUR E. FISHER

PART II.—THE LOWER LIMB

CONTAINING THIRTY-ONE PLATES, WITH EXPLANATORY TABLES

LONDON

LONGMANS, GREEN, AND CO.

1878

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TO

ROBERT LIVEING

DOCTOR OF MEDICINE

LECTURER ON DERMATOLOGY AND LATE LECTURER ON ANATOMY

AT THE MIDDLESEX HOSPITAL

THESE ANATOMICAL OUTLINES

ARE DEDICATED

AS A SLIGHT TOKEN OF ADMIRATION FOR HIM AS A

PRACTICAL TEACHER AND ESTEEM FOR HIM

AS A COLLEAGUE AND FRIEND

PREFACE

TO

PART THE SECOND.

As the Second Part of these 'Anatomical Outlines' may find its way into the hands of students, unaware of their real object, it is thought desirable again to say that they have been undertaken with a desire to lighten, as well as to direct, their labours.

It is believed that the time wasted with the weary work of constant repetition may be saved if a student will learn to remember his anatomy in the right way. A student who 'gets up' his knowledge by *reading*, learns to his cost that it is knowledge of a kind which vanishes in a few short weeks. On the other hand, if he has but a mental picture of the part about which he would know, his memory will carry his facts with scarcely an effort.

If he be a careful dissector, the best pictures are those he makes with his scalpel—his actual dissections. He should always

remember that he gains, by dissecting, not only the real anatomical knowledge necessary for the practice of his profession, but much of that manual skill he needs as a successful operator.

His dissections, however, vary from day to day, and he cannot always have these by him for reference.

The Outlines have been designed to enable him to chronicle the most important facts by a method which appeals to the memory through the eye.

It is not necessary that a student should be able to draw well, or at all, in order to make this plan useful. A line sometimes will show what is needed more clearly and more directly than a finished drawing. A single stroke, for example, will indicate the *course* of an artery, its *position* in the limb, and its *relation to the bone*. A few dots with a pen, again, will often tell as much, concerning the attachments of a muscle, and to better purpose than a whole string of words. The incisions, moreover, for an operation, can be much more fully understood when mapped in outline in the form of a diagram.

It is well known to every teacher how the mind seizes upon the slightest suggestion, and is thus able to recall a whole series of facts.

The same general plan has been adopted in this Part as in the first.

The bones of the foot have been drawn life-size, a knowledge

of their anatomy being especially important in its bearings on surgical operations in this region. It is hoped that these figures will be found of use not only to the student but to the general practitioner.

33 Harley Street, Cavendish Square, W.
May 1st, 1878.





ADVICE.

The student is advised, after commencing the dissection of a region, to indicate on the 'outline' the incisions he has made in order to reflect the skin. In this way the part he is about to fill in is marked out, and he follows with his pencil the incisions he has previously made with his scalpel.

It will be well, as his dissection progresses, first to outline the muscles, having previously ascertained as far as possible their exact attachments by dissection. Their general shape and superficial limits may be shown by *continuous* lines; their attachments beneath, which are often ascertained best after division, may be shown by *dotted* lines.

The arteries, important veins, and nerves may then be added. Wherever these are hidden by overlying structures, their course can be indicated by dotted lines. At his leisure he may complete his drawing. This is most satisfactorily done by using for the muscles thin washes of transparent colours. The arteries and veins may be shown in darker tints. The ligaments and tendons may be coloured with *gamboge*, and the nerves afterwards picked out with Chinese white, or with some other colour.

If the deeper muscles be coloured in with a wash of *blue*, and those more superficial with a wash of *lake*, a transparent drawing is made, which will show not only the origin and insertion of the muscles, with their deeper connections, but the relation of all these to the skeleton beneath, and often their bearing on surface form.

The structures which it is thought expedient to portray in each

region are named opposite each outline. The student, however, can follow to a certain extent his own taste in this matter. If he be skilful with his pencil or brush, he can introduce into a single outline several layers of muscles by means of transparent washes.

He can, if he chooses, finish some of the outlines more highly.

Those who have but little knowledge of drawing can mark the origin and insertion of muscles, and indicate the course of the principal vessels and nerves by mere strokes. Such a method may be rough, but it is clear and simple, and will be a great help to the memory, particularly where a muscle has wide attachments, or when it arises from several bones.[1]

As the 'Outlines' are designed to show the human body, as a whole rather than in parts or regions, the student can in many instances work beyond his special dissection. He may carry out the same method, or may vary the process, as he finds best. The lines he first makes to limit his drawing will not interfere with this plan; but he should remember that those structures alone are named which are fairly contained within the limits of a given region, and which can be wholly or in part indicated with clearness and advantage. Should he utilise the whole outline in this manner, the dissections before him will be the best guides, and he will be safe in following them. A list of the structures, which may be filled in, faces each outline. Those muscles printed in *italics* indicate that they are for the most part, or entirely, hidden by superficial structures.

An asterisk following a muscle is intended to show that it is removed. It is named again in order to remind the dissector that he will do well to mark again its attachments. He may use *red* for the origin and *blue* for the insertion. Coloured ink, used with a pen, will make his work neat and rapid.

Filling in an outline will be found an excellent test of growing knowledge, and by this simple method he will do much, as his facts accumulate, to save the drudgery of incessant repetition. If he be dissecting a right limb, he can use the outlines of the left for this purpose, as well as for recording occasional abnormalities.

[1] The Trapezius is a good example of the first condition, and the Flexor Brevis Pollicis of the second.

The blank pages will be found useful for the registration of notes or hints he is certain to gather whilst at work.

Lastly, he should bear in mind that no two bones are exactly alike. They differ as widely as human faces. The author has endeavoured to choose typical examples. He has tested all the doubtful points on the dead subject by comparison as far as possible with the living. In no case has the artist trusted entirely to the fancy of the articulator.

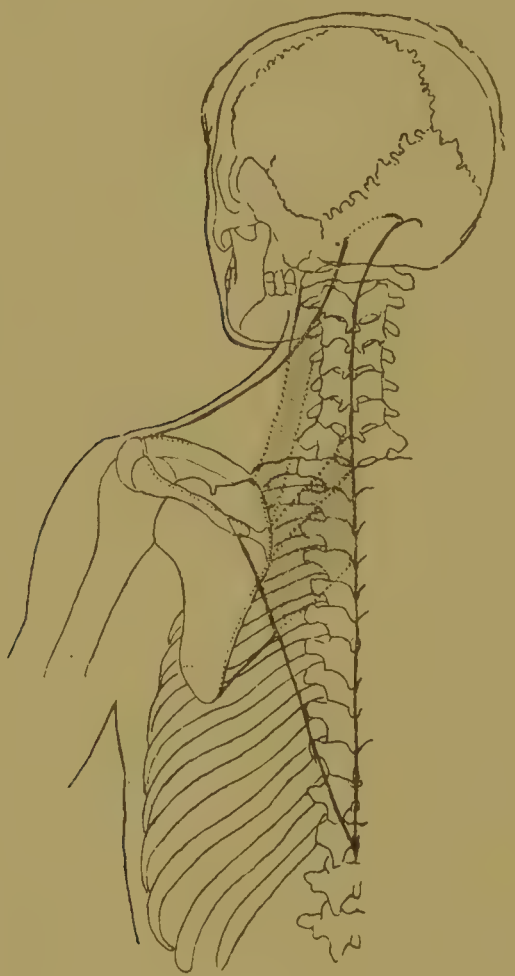
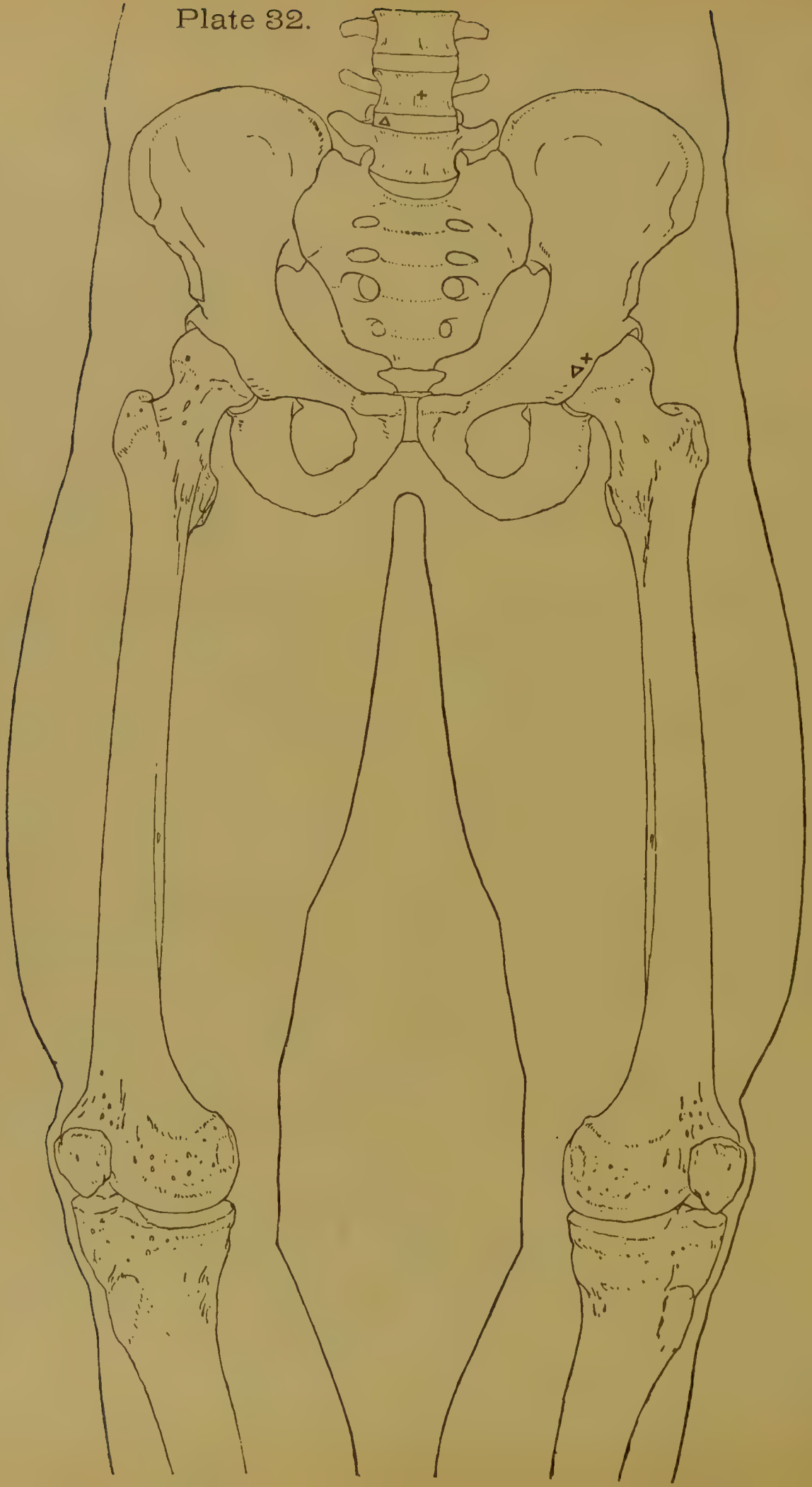


Plate 32.



FRONT VIEW OF THIGH.

RIGHT OR LEFT I.

Poupart's ligament.
Fascia lata.
Saphenous opening.

Arteries.

Superficial epigastric.
Superficial circumflex iliac.
Superficial external pudic.

Veins.

Superficial epigastric.
Superficial circumflex iliac.
Superficial external pudic.
Internal saphenous (with tributaries from thigh).

Nerves.

External cutaneous (LP 2).
Middle cutaneous (anterior crural).
Genito-crural (crural branch) (LP 2).
Ilio-inguinal (LP 1).

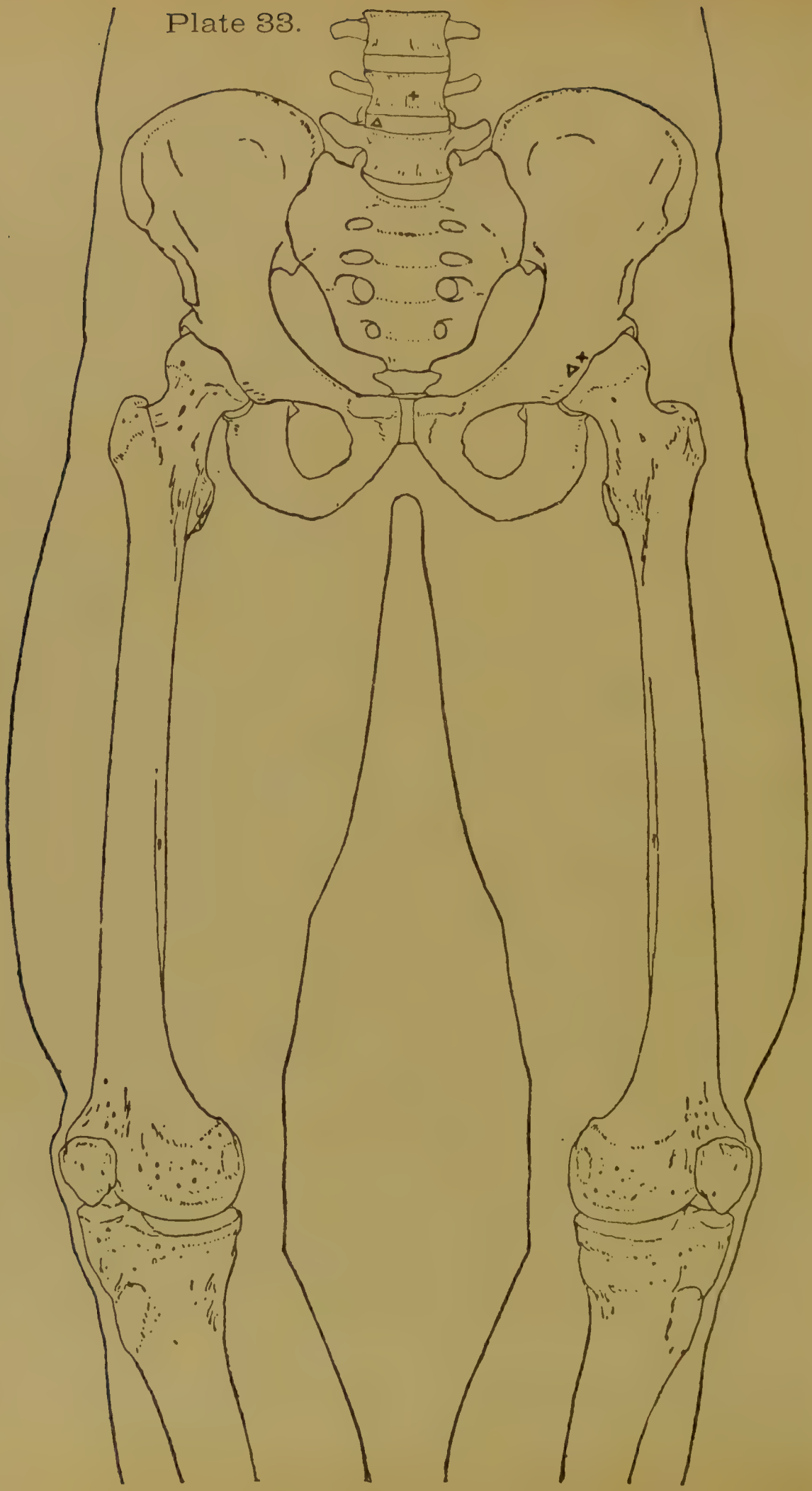
Glands.

Inguinal lymphatic (in two groups).

LP = Lumbar Plexus. SP = Sacral Plexus.

NOTE.—A + shows the position of an *artery*, serving as a landmark. A △ is the sign for a vein.

Plate 33.



FRONT VIEW OF THIGH.

RIGHT OR LEFT II.



Muscles.

Sartorius.
Psoas.
Iliacus.
Adductor longus.
Pectineus.

Arteries.

Femoral.
- Superficial epigastric.
- Superficial circumflex iliac.
- Superficial external pudic.
- Profunda.

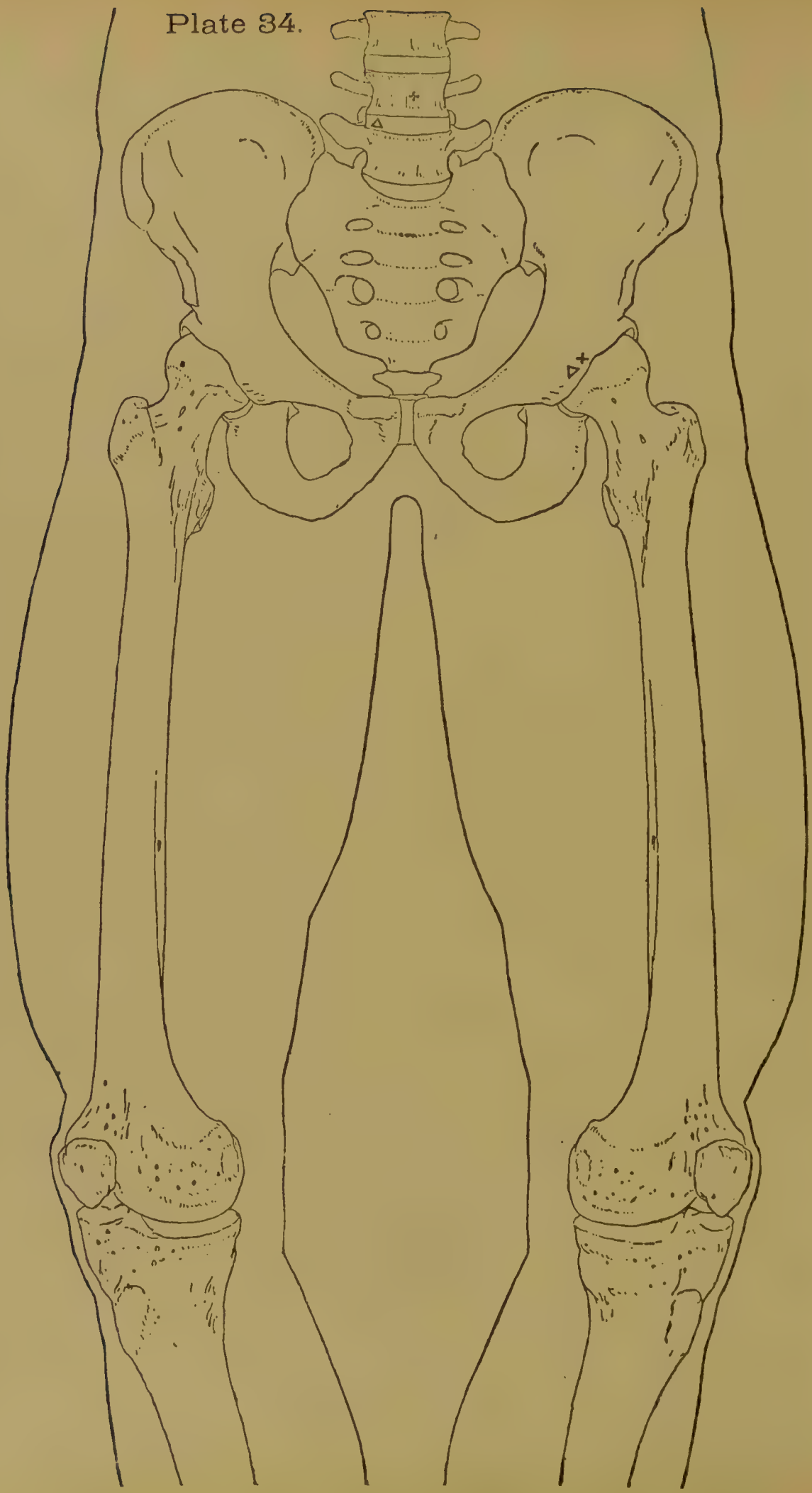
Veins.

Femoral.
- Saphenous.

Nerves.

Anterior crural (LP 34).

Plate 34.



FRONT VIEW OF THIGH.

RIGHT OR LEFT III

Muscles.

Tensor vaginæ femoris.
Rectus.
Sartorius.
Vastus internus.
Adductor longus.
Pectineus.
Gracilis.

Arteries.

Femoral.

Profunda.
External circumflex.
Internal circumflex.

Plate 35.



INNER VIEW OF THIGH.

RIGHT OR LEFT.

Muscles.

Sartorius.
Gracilis.
Rectus.
Adductor magnus.
Vastus internus.

Arteries.

Anastomotica magna.

Nerves.

Internal saphenous (superficial portion below knee).
Patellar branch.

Plate 36.



GLUTEAL REGION AND BACK OF THIGH.

Right or Left I.

Muscles.

Gluteus maximus.
Gluteus medius.
Biceps.
Semitendinosus.
Semimembranosus.

Nerves.

Last dorsal (iliac branch).
Ilio-hypogastric (LP 1).
External cutaneous (LP 2).
Small sciatic (cutaneous branches).
Sacral (cutaneous branches).

Plate 37.



GLUTEAL REGION AND BACK OF THIGH.

RIGHT OR LEFT II.

Muscles.

Gluteus maximus.*
Gluteus medius.
Pyriformis.
Gemellus superior.
Obturator internus (tendon).
Gemellus inferior.
Quadratus femoris.
Biceps.
Semitendinosus.
Semimembranosus.
Adductor magnus.

Arteries.

Gluteal (superficial portion).
Sciatic.
- Coccygeal.
- Inferior gluteal.
- Comes nervi ischiadici.
- Muscular.

Internal pudic (internal iliac).
Internal circumflex (femoral).
Perforating (femoral).

Ligaments.

Sacro sciatic.



GLUTEAL REGION AND BACK OF THIGH.

RIGHT OR LEFT III.

Muscles.

Gluteus maximus.*
Gluteus medius.*
Gluteus minimus.
Pyriformis.
Gemelli.
Obturator internus (tendon).
Quadratus femoris.*
Obturator externus.
Hamstrings.*
Adductor magnus.

Arteries.

Gluteal (deep portion).
- Superior branch.
- Inferior branch.

Nerves.

Small sciatic.
- Inferior gluteal.
- Inferior pudendal.

Superior gluteal (lumbo-sacral cord).

Great sciatic.
- Internal popliteal.
- External popliteal.

Plate 39.



Plate 40.



OUTER VIEW OF THIGH.

RIGHT OR LEFT.

Muscles.

Gluteus maximus.*
Gluteus medius.*
Gluteus minimus.
Rectus femoris.
Vastus externus.
Biceps.
Pyriformis.

Arteries.

Gluteal.
Internal pudic (crossing ischial spine).

Ligaments.

Great sciatic.
Small sciatic.

Plate 41.



Plate 42.



POPLITEAL SPACE.

RIGHT OR LEFT I.

Muscles.

Biceps.
Semitendinosus.
Semimembranosus.
Gastrocnemius.

Arteries.

Sural (popliteal).
Cutaneous (popliteal).

Vein.

External saphenous.

Nerves.

Internal popliteal.
External saphenous.
External popliteal.
Communicans fibularis.
Small sciatic.

Plate 43.







POPLITEAL SPACE.

RIGHT OR LEFT II.

Muscles.

Biceps.
Semitendinosus.
Semimembranosus
Plantaris.
Popliteus.

Arteries.

Popliteal.
Articular.
Muscular.

Vein.

Popliteal.

BACK VIEW OF LEG AND POPLITEAL SPACE.

Right or Left I.

Muscles.

Gastrocnemius.
Biceps.
Semitendinosus.
Semimembranosus.

Arteries.

Popliteal.
Superior muscular.
Inferior muscular (sural).

Plate 44.



BACK VIEW OF LEG AND POPLITEAL SPACE

RIGHT OR LEFT II.

Muscles.

Gastrocnemius.*
Soleus.*
Plantaris.*
Popliteus.
Flexor longus digitorum.
Flexor longus pollicis.
Tibialis posticus.

Arteries.

Popliteal.
- Articular.
- Upper muscular.
- Sural.

Posterior tibial.
- Peroneal.
- Anterior peroneal.
- Muscular.
- Nutrient.
- Communicating.
- Internal calcaneous.

Plate 45.

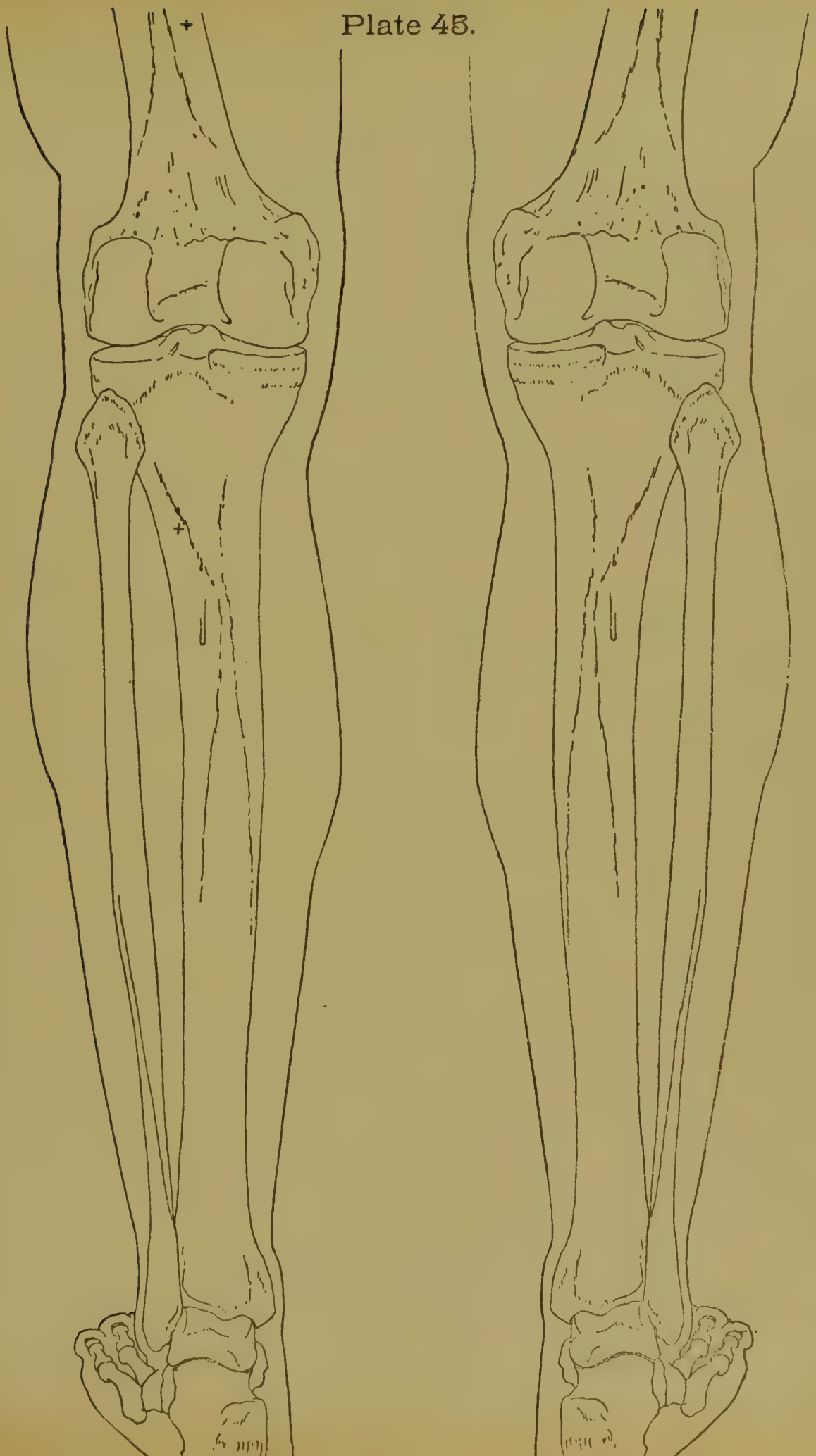


Plate 46.





INNER VIEW OF ANKLE.

RIGHT.

I.

Muscles.

Flexor longus digitorum.
Flexor longus pollicis.
Tibialis posticus.
Tendo Achillis.
Plantaris (tendon).
Abductor pollicis.

Arteries.

Posterior tibial.

Veins.

Venæ comites (posterior tibial).

Nerves.

Posterior tibial.

Ligament.

Internal annular.

II.

Muscles.

Flexor longus digitorum.
Flexor longus pollicis.
Tibialis posticus.
Tendo Achillis.
Plantaris tendon.
Abductor pollicis.*

Arteries.

Posterior tibial.
Internal plantar.
External plantar.

Veins.

Venæ comites (posterior tibial).

Nerves.

Posterior tibial.
Internal plantar.
External plantar.

INNER VIEW OF ANKLE.

LEFT.

I.

Muscles.

Flexor longus digitorum.
Flexor longus pollicis.
Tibialis posticus.
Tendo Achillis.
Plantaris (tendon).
Abductor pollicis.

Arteries.

Posterior tibial.

Veins.

Venæ comites (posterior tibial).

Nerves.

Posterior tibial.

Ligament.

Internal annular.

II.

Muscles.

Flexor longus digitorum.
Flexor longus pollicis.
Tibialis posticus.
Tendo Achillis.
Plantaris (tendon).
Abductor pollicis.*

Arteries.

Posterior tibial.
Internal plantar.
External plantar.

Veins.

Venæ comites (posterior tibial).

Nerves.

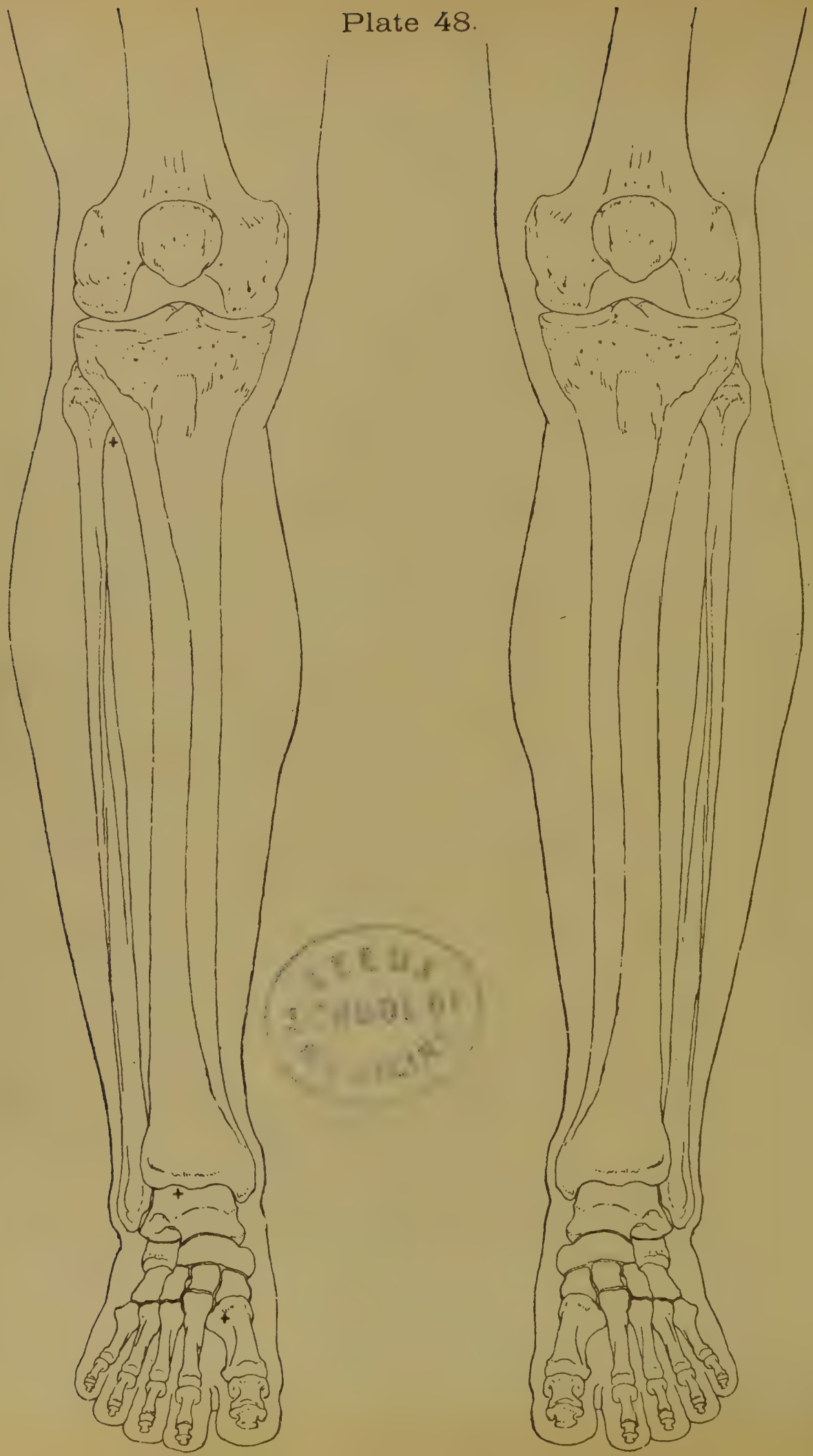
Posterior tibial.
Internal plantar.
External plantar.

Plate 47.





Plate 48.



FRONT VIEW OF LEG.

RIGHT OR LEFT I.

Muscles.

Peronei.
Gastrocnemius.
Soleus.
Tibialis anticus.
Extensor longus digitorum
Extensor proprius pollicis.

Arteries.

Recurrent tibial.
Inferior articular, internal (popliteal).
Inferior articular, external (popliteal).

Ligament.

Ligamentum patellæ.

FRONT VIEW OF LEG.

RIGHT OR LEFT II.

Muscles.

Extensor longus digitorum.
Tibialis anticus.*
Extensor proprius pollicis.

Arteries.

Anterior tibial.
- Recurrent.
- Muscular.
- Internal malleolar.
- External malleolar.

Anterior peroneal (peroneal).

Plate 49.

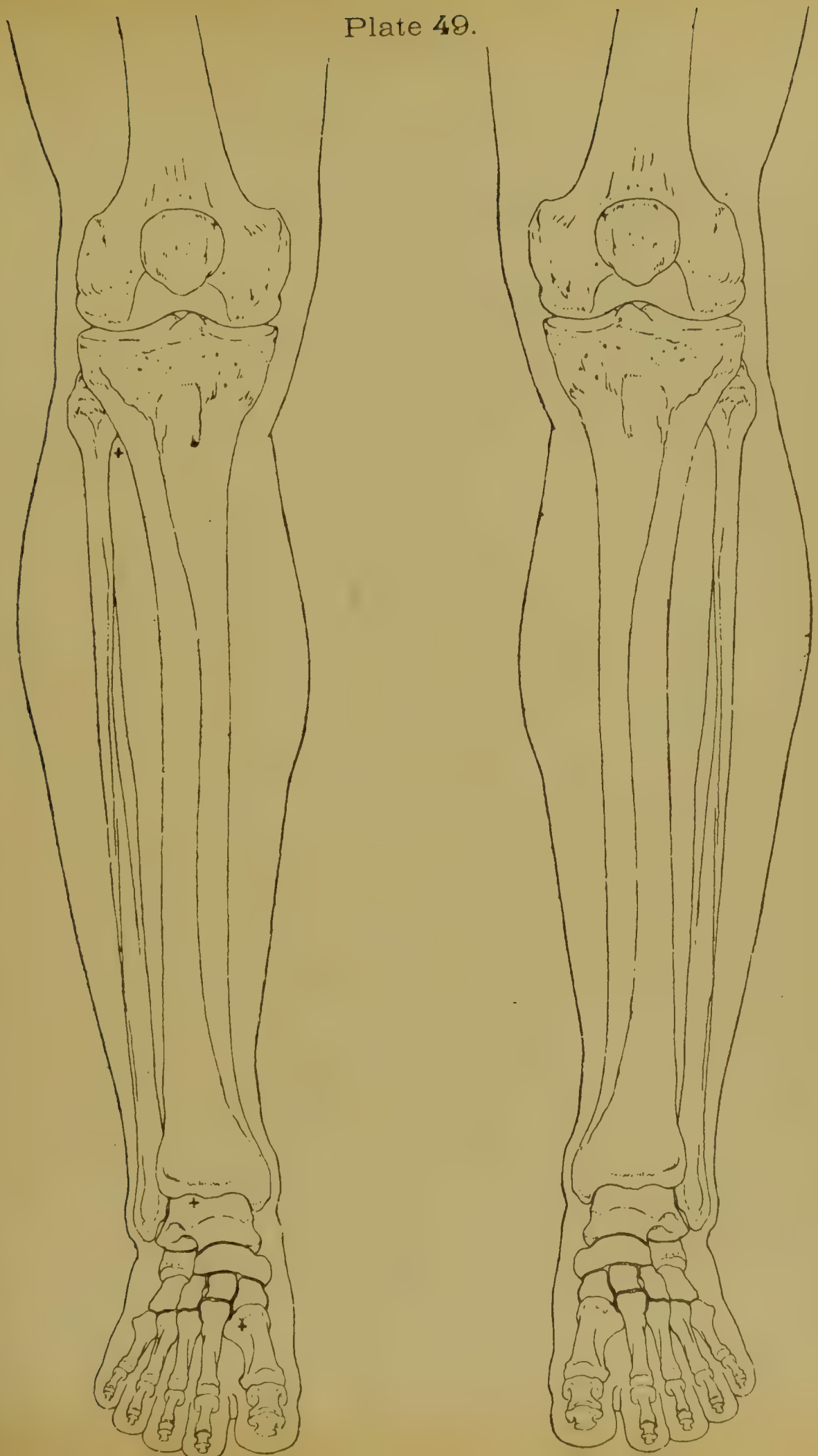
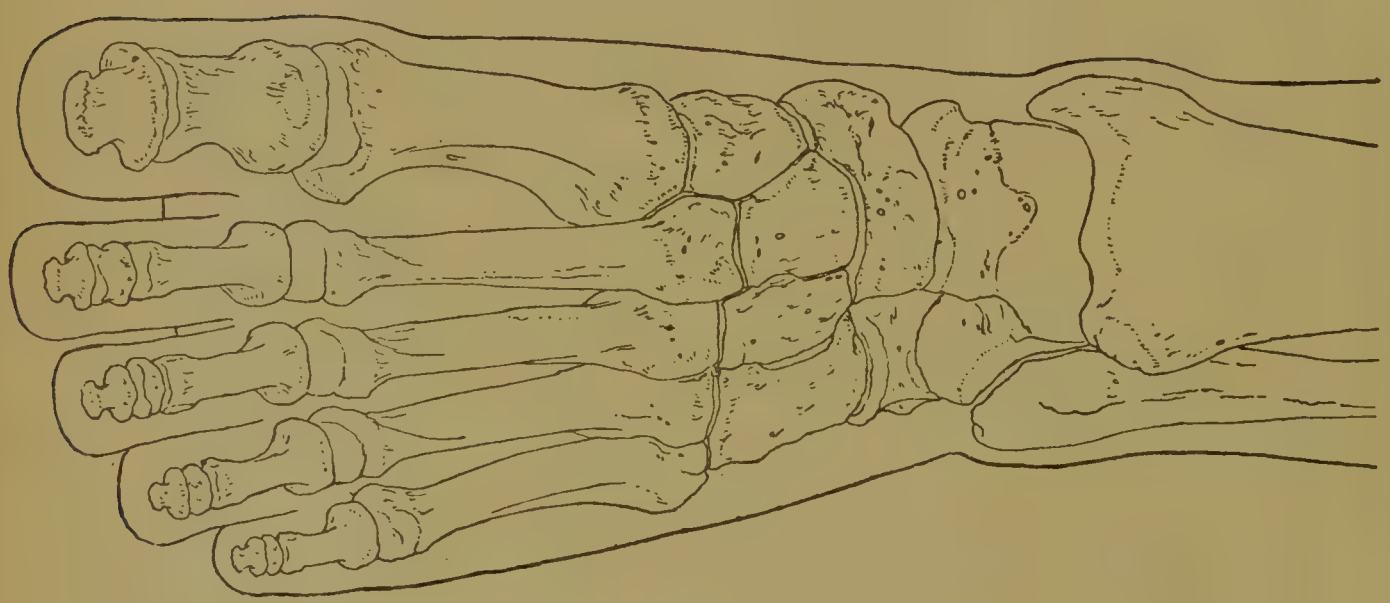
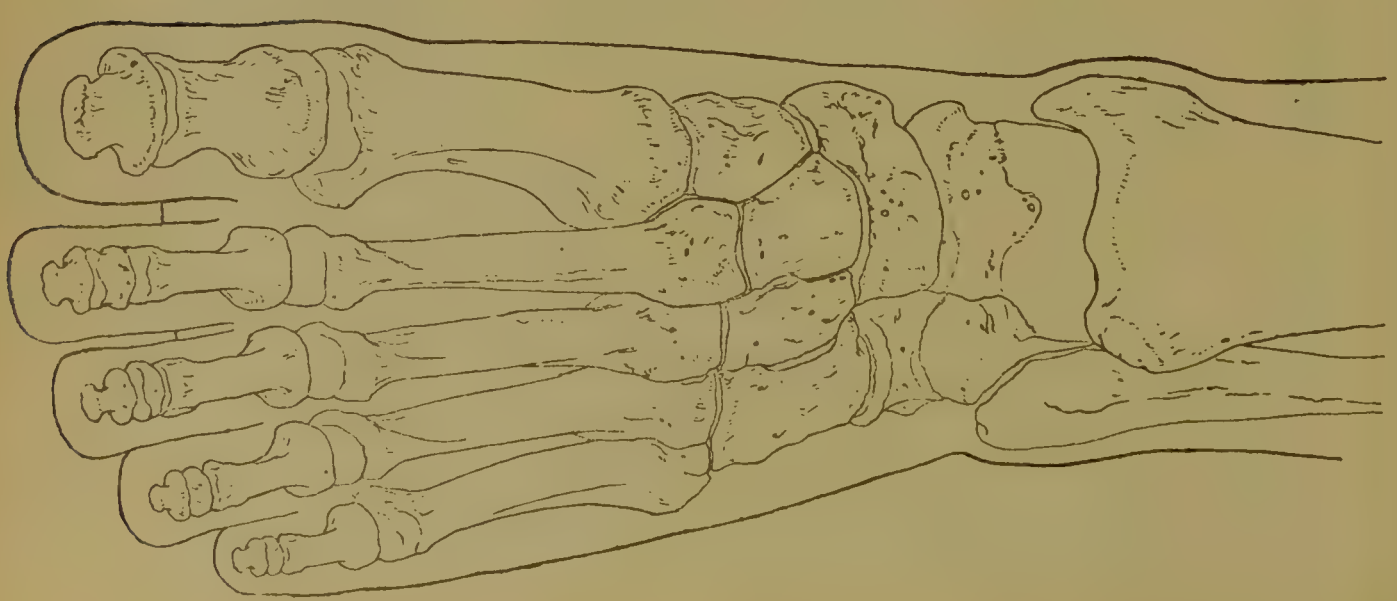


Plate 50.







DORSUM OF FOOT.

RIGHT OR LEFT.

I.

Muscles.

Tibialis anticus.
Extensor proprius pollicis.
Extensor longus digitorum.
Peroneus tertius.

Arteries.

Anterior tibial.
- Internal malleolar.
- External malleolar.
- Tarsal.
- Metatarsal.
- Dorsalis hallucis.

Ligament.

Anterior annular.

II.

Muscles.

Tibialis anticus.*
Extensor proprius pollicis.*
Extensor longus digitorum (beyond metatarso-phalangeal joints).
Peroneus tertius.*
Extensor brevis digitorum.

Arteries.

Anterior tibial.
- Dorsalis hallucis.

Nerve.

Anterior tibial.

DORSUM OF FOOT (continued).

RIGHT OR LEFT.

III.

Muscles.

Extensor longus digitorum.*
Extensor brevis digitorum* (innermost tendon).
Interossei (dorsal).

Arteries.

Anterior tibial.

Tarsal.
Metatarsal.
Interosseæ.
Dorsalis hallucis.

Nerves.

Anterior tibial (external popliteal).
Musculo-cutaneous (external popliteal).
Short saphenous (internal popliteal).

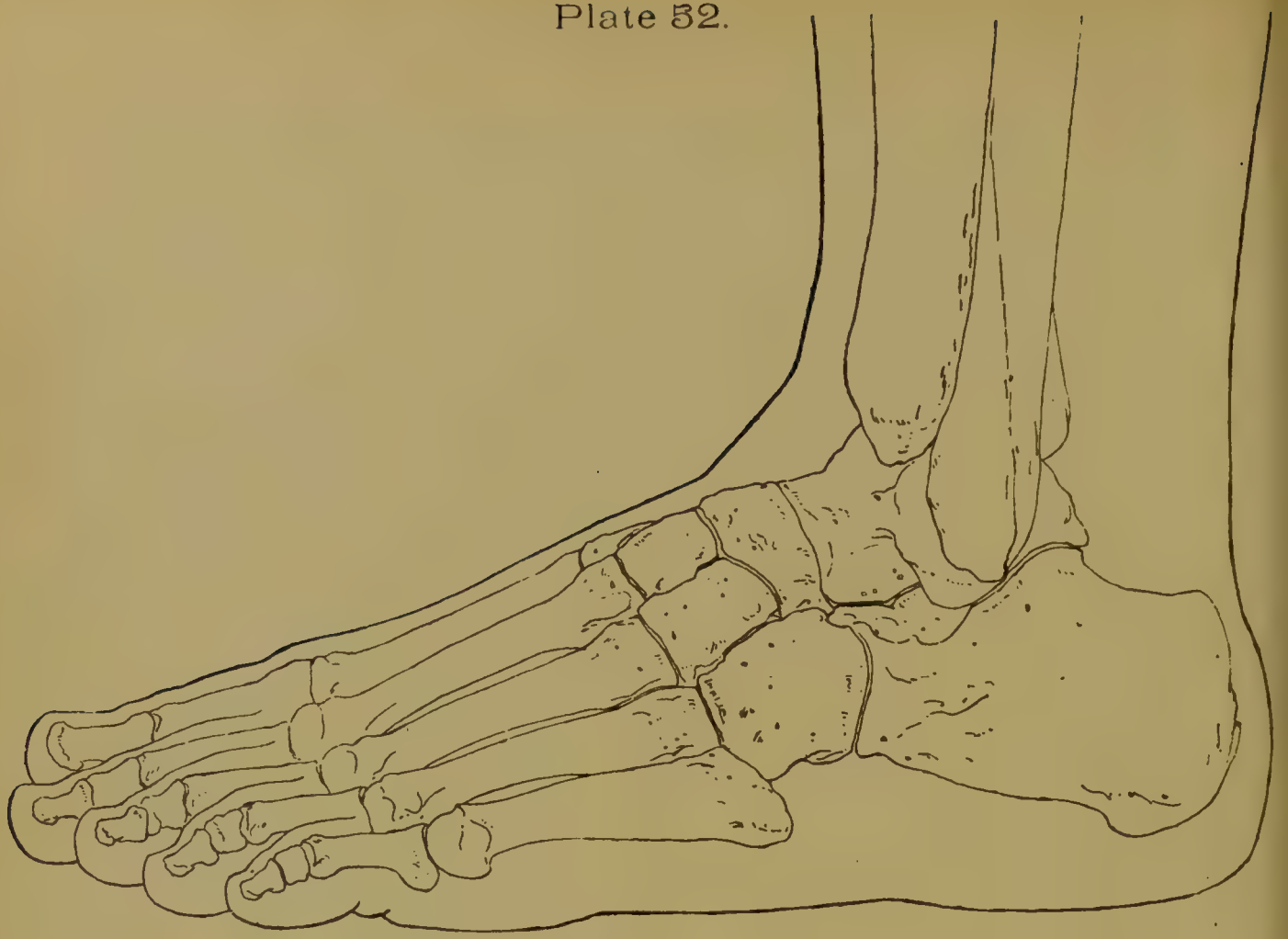
Plate 51.







Plate 52.





OUTER VIEW OF ANKLE.

RIGHT OR LEFT.

I.

Muscles.

Peroneus longus.
Peroneus brevis.
Peroneus tertius.
Tendo Achillis.

II.

Muscles.

Peroneus brevis.*
Peroneus tertius.*

Arteries.

Anterior peroneal (peroneal).
External malleolar (anterior tibial).

Plate 53.

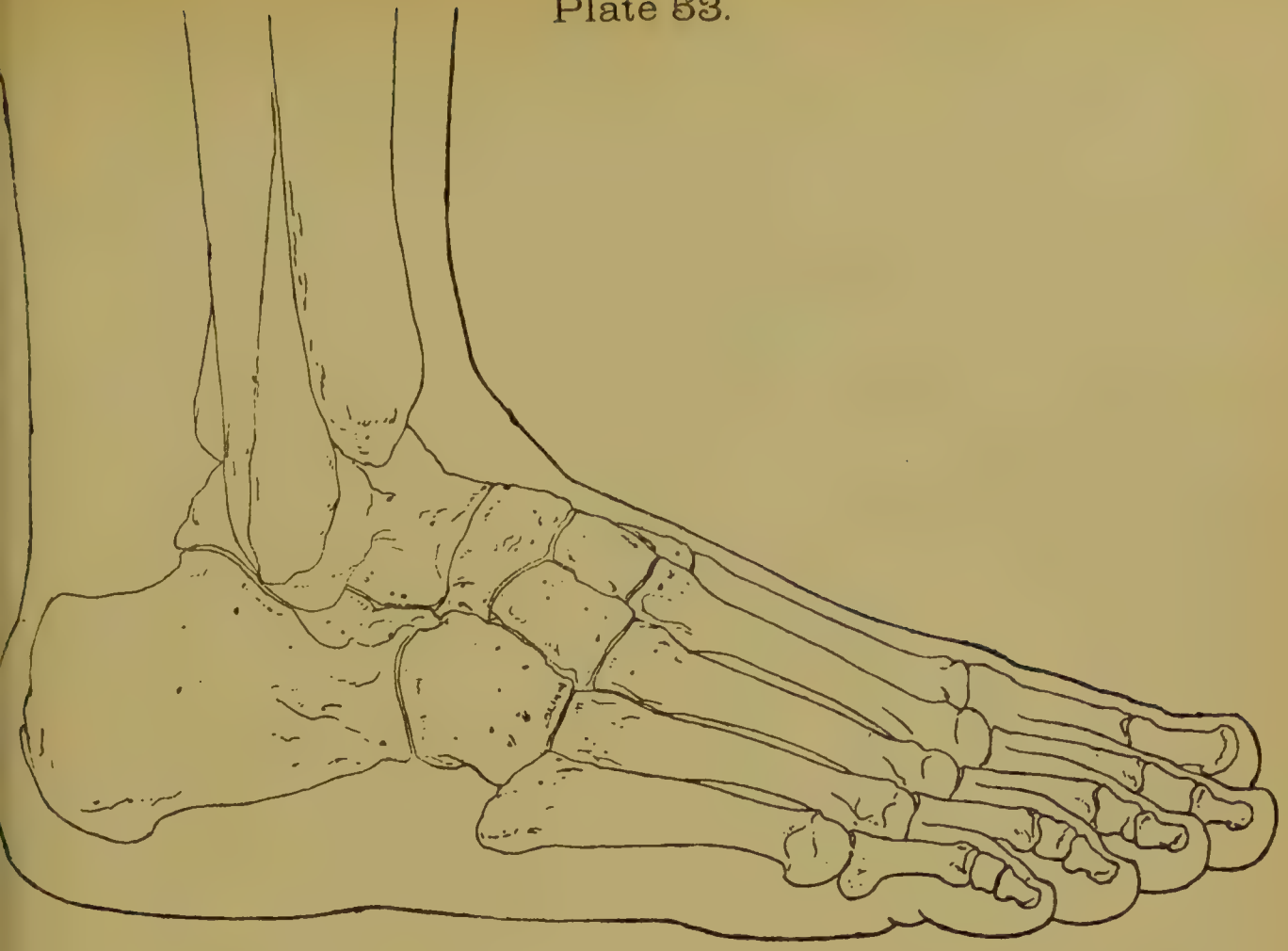
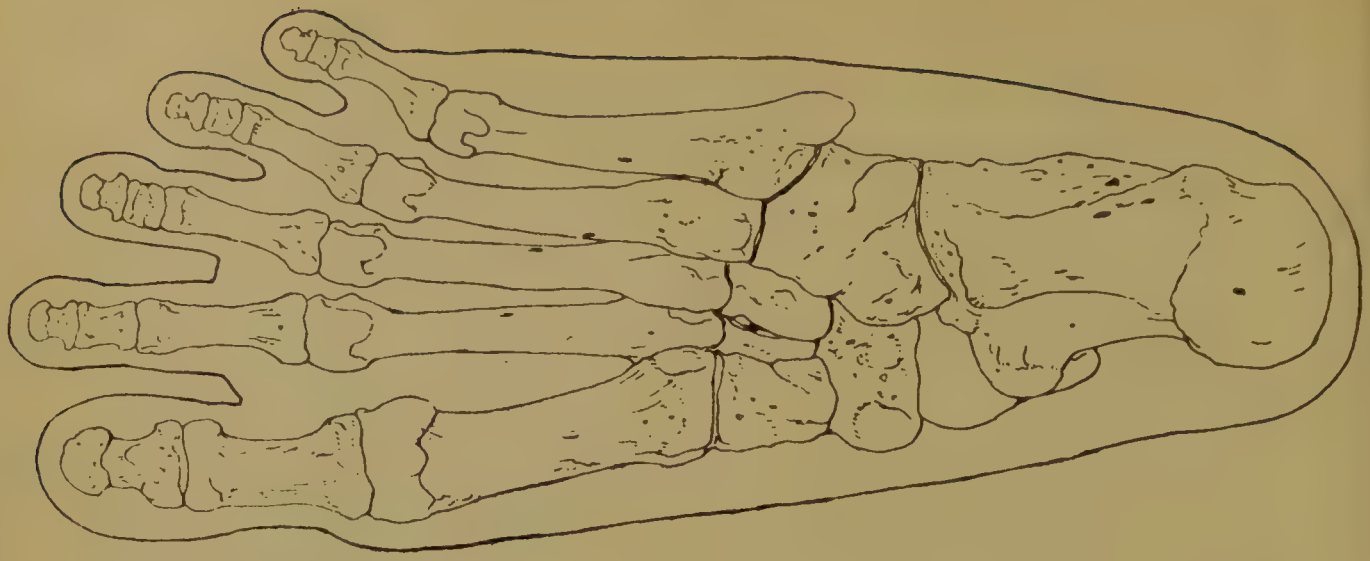




Plate 54.







SOLE OF FOOT.

RIGHT OR LEFT.

I.

Muscles.

Abductor pollicis.
Abductor minimi digiti.
Flexor brevis digitorum.

II.

Muscles.

Abductor pollicis.*
Abductor minimi digiti.*
Flexor brevis digitorum.*
Flexor longus pollicis (tendon).
Flexor brevis pollicis.
Flexor longus digitorum (tendons).
Flexor accessorius.
Lumbricales.

Arteries.

Internal plantar (posterior tibial).
External plantar (posterior tibial).

Nerves.

Internal plantar (posterior tibial).
External plantar (posterior tibial).

III.

Muscles.

Flexor brevis pollicis.
Adductor pollicis.
Flexor brevis minimi digiti.
Transversus pedis.
Interossei.

Artery.

External plantar.

Plate 55.







Plate 56.



LIGAMENTS OF PELVIS AND HIP-JOINT.

Sacrum with Ilium.

Anterior sacro-iliac.

Posterior sacro-iliac.

- Posterior superior horizontal portion.
- Posterior oblique portion.

Sacrum with Ischium.

Great sacro-sciatic.

Small sacro-sciatic.

Pubic Bones with each other.

Anterior pubic.

Posterior pubic.

Superior pubic.

Subpubic.

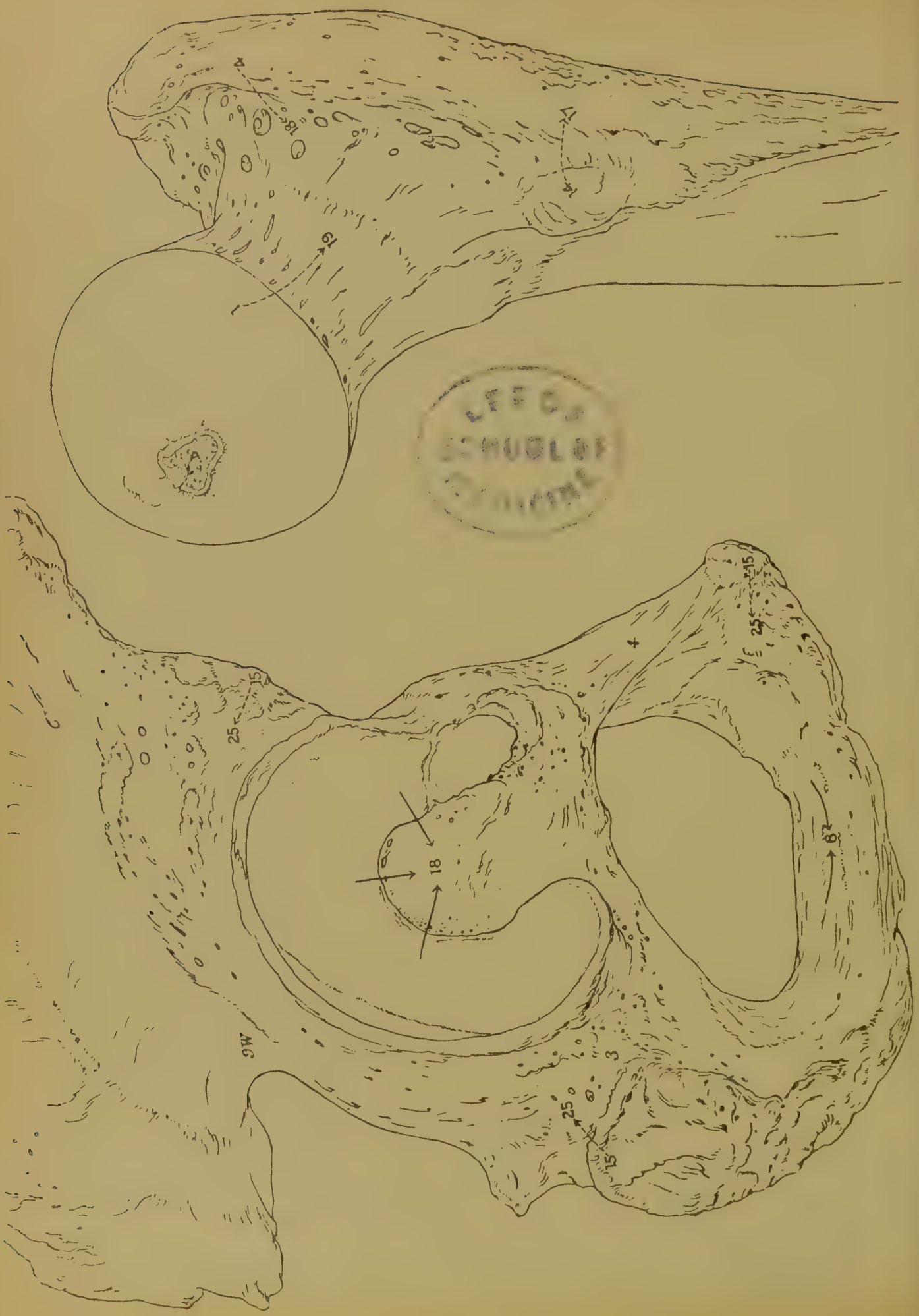
Intermediate fibro-cartilage.

Hip-joint.

Capsular.

Ilio-femoral.

Plate 57.



LIGAMENTS, ETC., OF HIP-JOINT AND THYROID FORAMEN.

Hip-joint.

Cotyloid.

Transverse.

Teres.

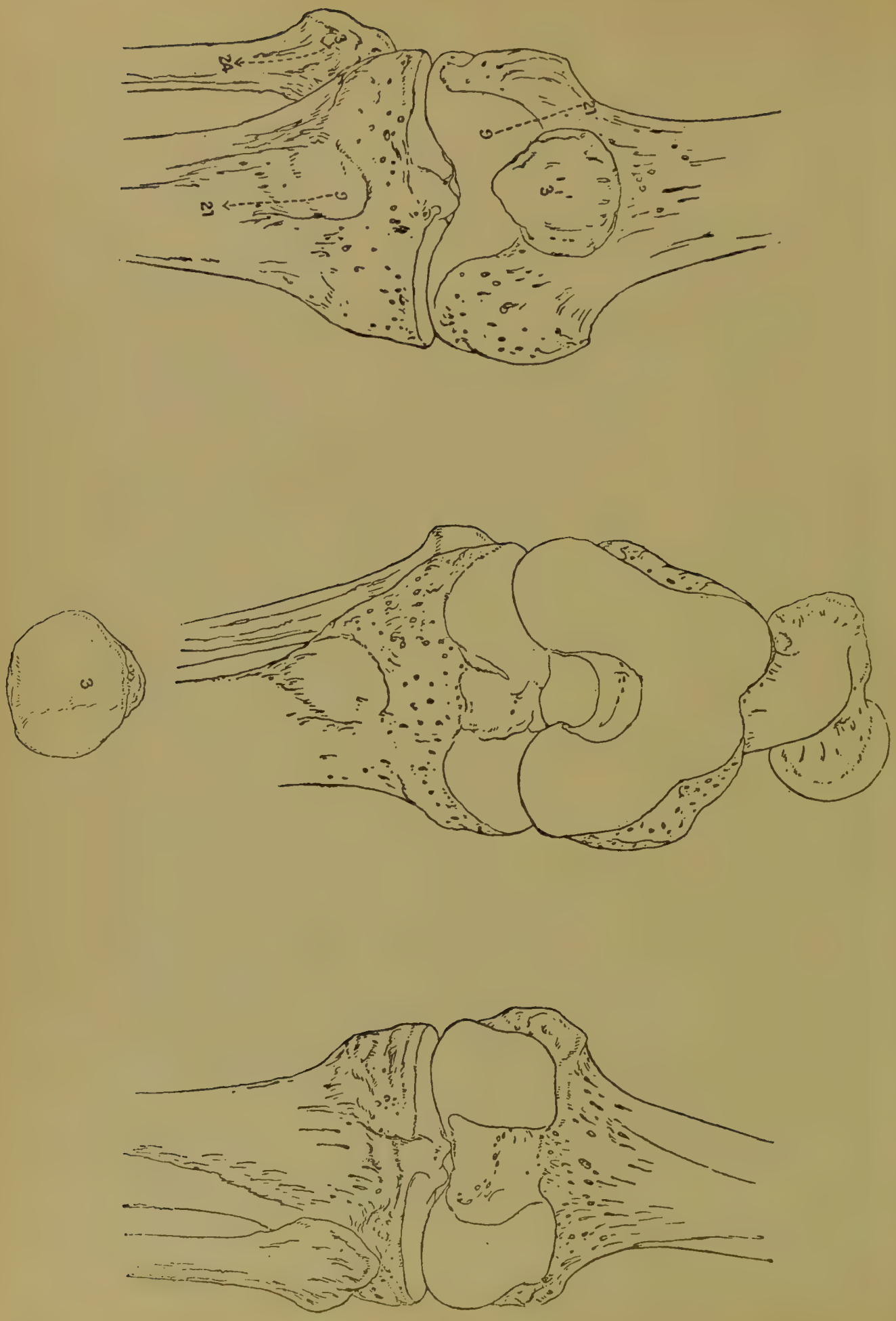
Capsular (posterior portion to neck of femur).

Thyroid Foramen.

Obturator membrane.

NOTE.—The figures indicate the position and number of the centres of ossification, and the average time at which these make their appearance. The upright figures denote *years*, the sloping figures *months*, except when followed by a W, when *weeks* are intended. All sloping figures therefore refer to a period *before birth*. A solid arrow → serves to show the manner in which the chief centres coalesce; the time at which this union takes place being shown by figures between their points. The dotted arrows ·····> point to the period at which the epiphyses join these or the shaft.

Plate 58.



LIGAMENTS, ETC., OF KNEE AND SUPERIOR TIBIO-FIBULAR JOINT.

I.

Knee.

Exterior Ligaments.

Capsular.
Tendon of quadriceps.
Ligamentum patellæ.
Posterior (Winslow's).
Tendon of semimembranosus.

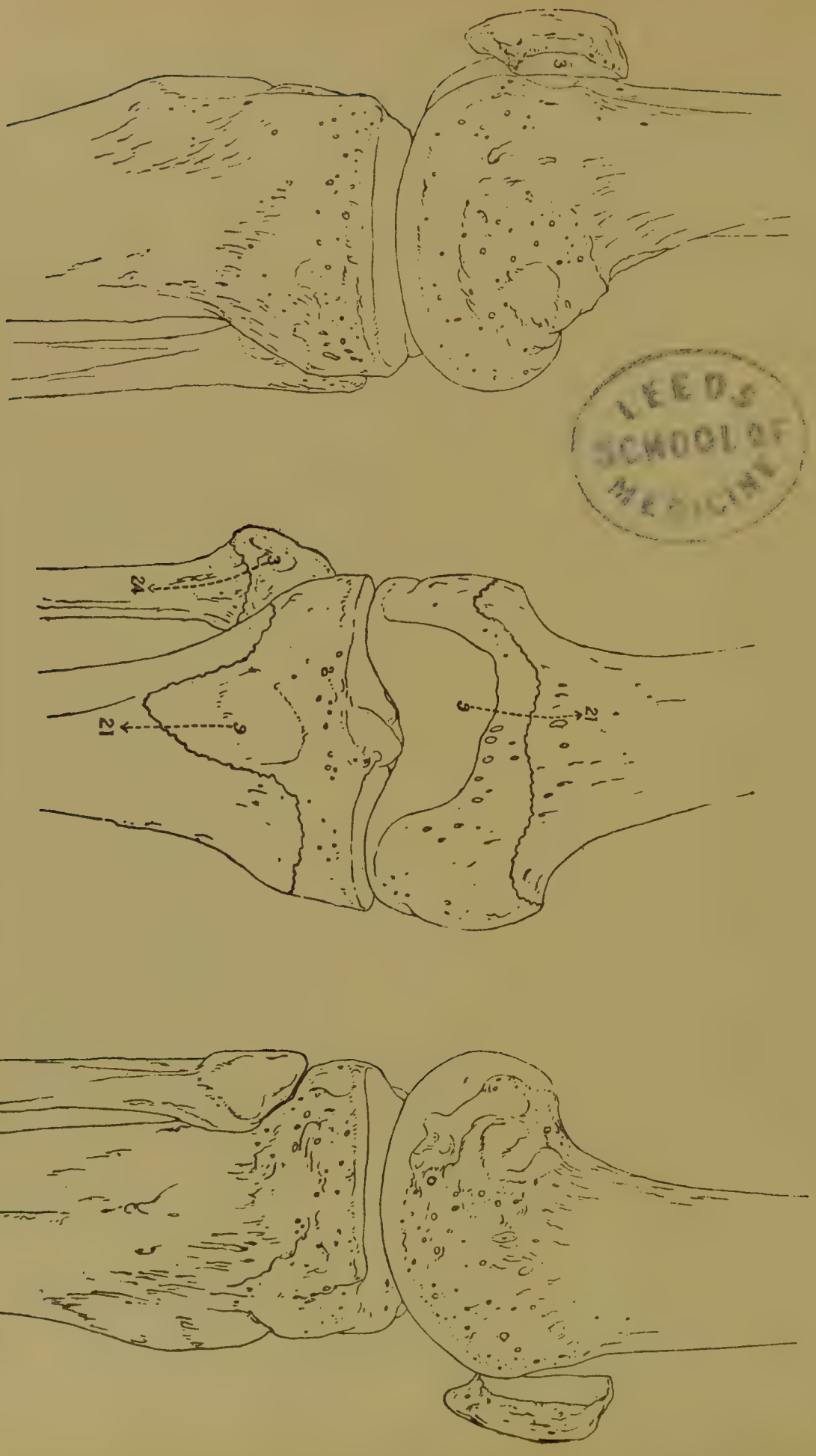
Interior Ligaments.

Anterior crucial.
Posterior crucial.
Internal semilunar cartilage.
External semilunar cartilage.
Transverse.

Tibia and Fibula.

Anterior superior tibio-fibular.
Posterior superior tibio-fibular.

Plate 59.



LEEDS SCHOOL OF MEDICINE

LIGAMENTS, ETC., OF KNEE AND SUPERIOR TIBIO-FIBULAR JOINT.

II.

Internal lateral.

External lateral.

Long.

Short.

Tendon of popliteus.

LIGAMENTS OF ANKLE-JOINT AND INFERIOR TIBIO-FIBULAR JOINT.

Tibia and Fibula.

Inferior interosseous.

Anterior inferior tibio-fibular.

Posterior inferior tibio-fibular.

Transverse.

Ankle.

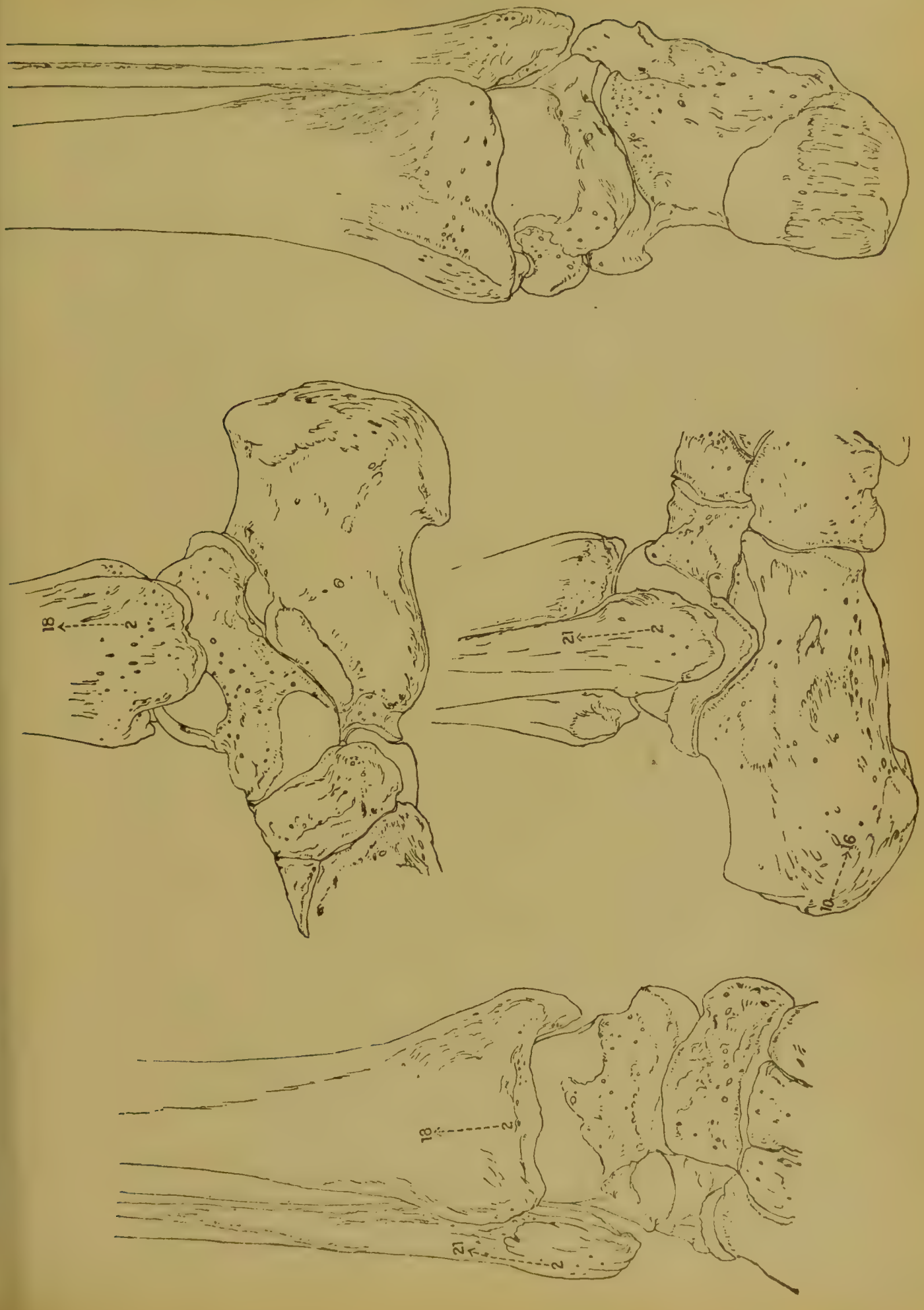
Anterior (tibio-tarsal).

Internal lateral (deltoid).

External lateral.

- Anterior fasciculus.
- Middle fasciculus.
- Posterior fasciculus.

Plate 60.



LIGAMENTS OF DORSUM OF FOOT AND PHALANGES.

Superior calcaneo-cuboid.
Internal calcaneo-cuboid.
External calcaneo-astragaloid.
Superior calcaneo-scaphoid.
Superior astragalo-scaphoid.
Dorsal (from scaphoid to cuneiform bones and cuboid).
&c. &c. &c.

Plate 61.



LIGAMENTS OF SOLE OF FOOT AND PHALANGES.

Long calcaneo-cuboid.
Short calcaneo-cuboid.
Inferior calcaneo-scaphoid.
&c. &c. &c.

Plate 62.



ANATOMICAL OUTLINES

PART III.

LONDON : PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
AND PARLIAMENT STREET

ANATOMICAL OUTLINES

FOR THE USE OF STUDENTS IN THE DISSECTING ROOM

AND SURGICAL CLASS ROOM



BY

ARTHUR HENSMAN

SENIOR DEMONSTRATOR OF ANATOMY AT THE MIDDLESEX HOSPITAL

WITH ORIGINAL DRAWINGS by ARTHUR E. FISHER

PART III.—THE THORAX AND ABDOMEN

CONTAINING TWENTY-SEVEN PLATES, WITH EXPLANATORY TABLES

LONDON

LONGMANS, GREEN, AND CO.

1879

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TO

ROBERT LIVEING

DOCTOR OF MEDICINE

LECTURER ON DERMATOLOGY AND LATE LECTURER ON ANATOMY

AT THE MIDDLESEX HOSPITAL

THESE ANATOMICAL OUTLINES

ARE DEDICATED

AS A SLIGHT TOKEN OF ADMIRATION FOR HIM AS A

PRACTICAL TEACHER AND ESTEEM FOR HIM

AS A COLLEAGUE AND FRIEND



PREFACE

TO

PART THE THIRD.

The difficulty often experienced by students in gaining a knowledge of the position and relations of the viscera to each other, and to the skeleton, has suggested the plan of introducing these in outline.

A knowledge, moreover, of the landmarks and guides to the organs within, rightly shares an important place in medical examinations at the present day. In this endeavour it must be obvious that perfect accuracy cannot be attained; allowance must be made for the varying size and shape of the viscera. The bony framework, too, not only presents special individual differences, but is subject to alterations impressed upon it by habits of life, dress, and occupation, as well as to the changes resulting from the respiratory process. It has been thought that short descriptions of the relations of the more important organs would be useful. These have accordingly been added with some

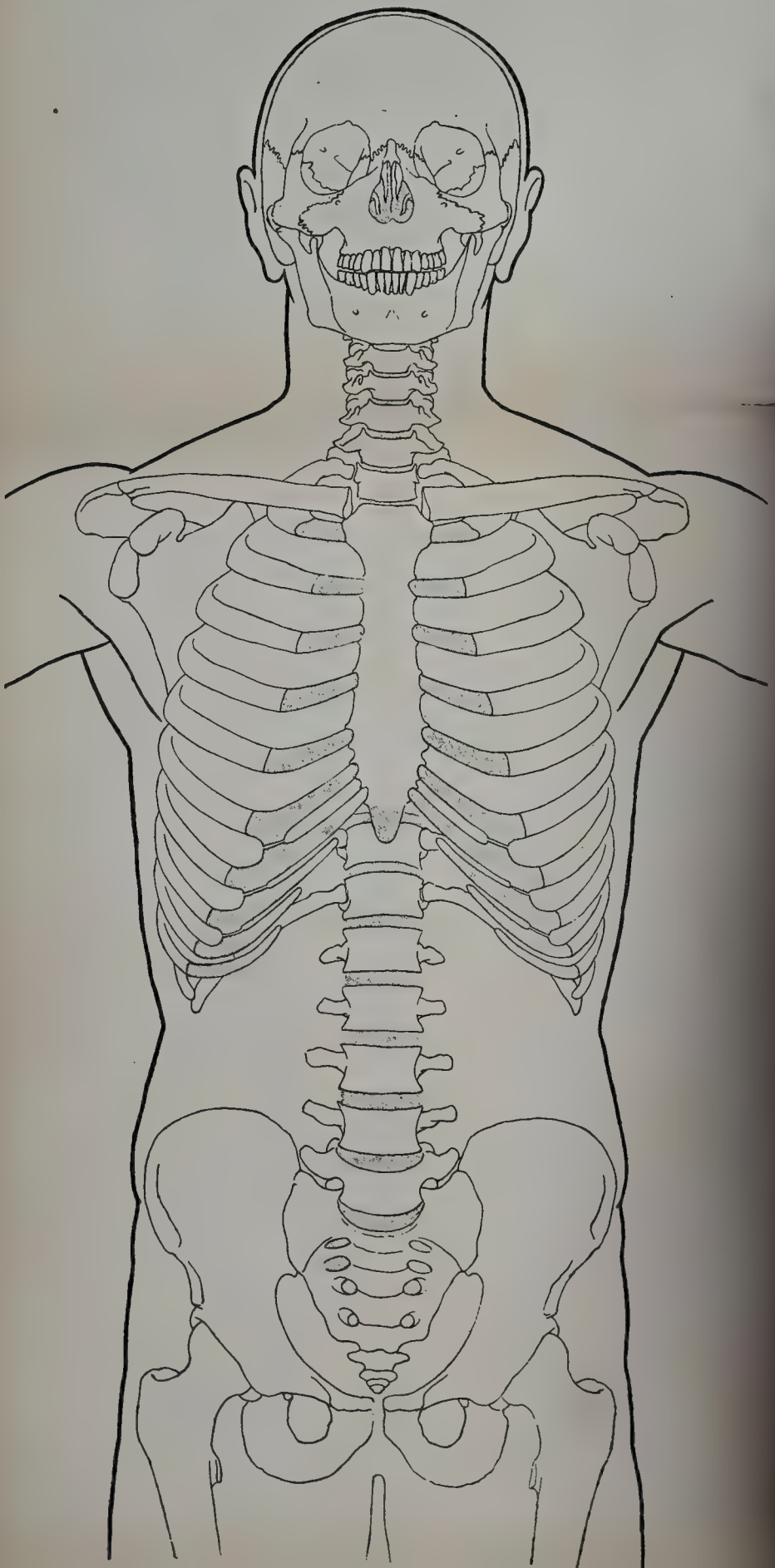
blank outlines, which can be filled in by the student. In other respects the original plan of this work has been followed.

The author wishes to acknowledge his obligations to his friend Mr. W. Roger Williams, M.R.C.S., Assistant Demonstrator of Anatomy at the Middlesex Hospital, for valuable assistance he has rendered in the preparation of this Part.

33 Harley Street, Cavendish Square, W.
November 12th, 1878.



Plate 63.





FRONT VIEW OF THORAX AND ABDOMEN.

Right Side.

Muscles.

Rectus abdominis.
External oblique.

Arteries.

Superficial epigastric (femoral).
Superficial external pudic (femoral).
Superficial circumflex iliac (femoral).

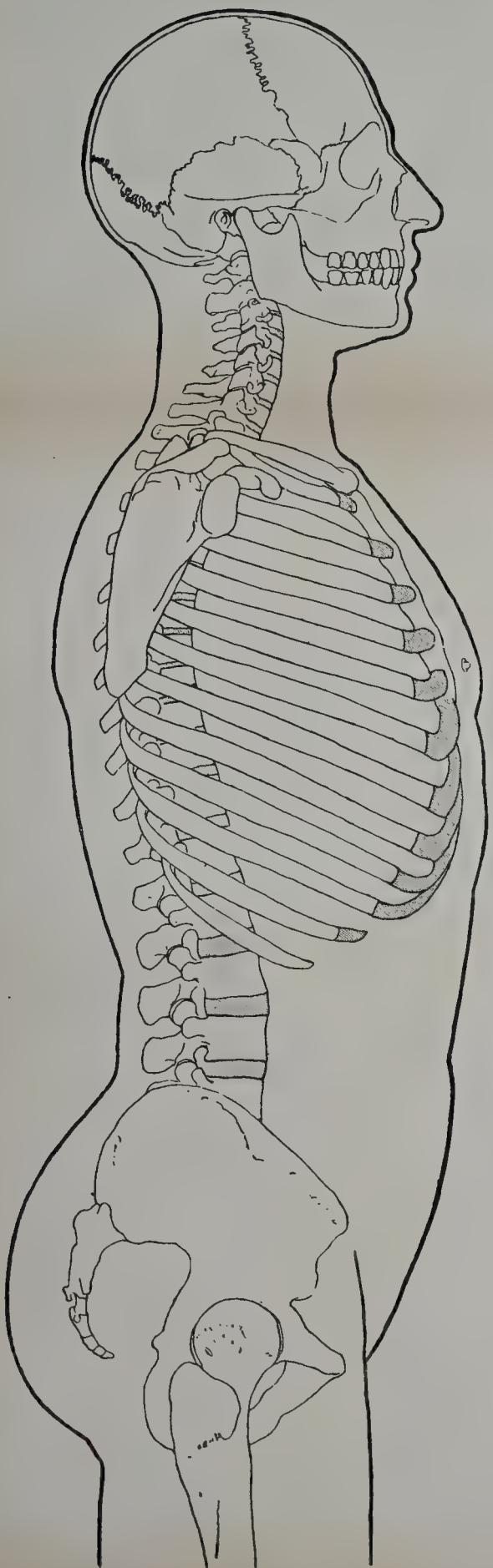
Left Side.

Rectus abdominis.
Intercostals.
Internal oblique.

Nerves.

Intercostal.
Anterior branches.
Ilio-inguinal.
Ilio-hypogastric.

Plate 64.



SIDE VIEW OF THORAX AND ABDOMEN.

Right.

Muscles.

Rectus abdominis.
External oblique.
Serratus magnus.

Nerves.

Iliac branch of ilio-hypogastric.
Iliac branch of last dorsal.

Left.

Muscles.

Latissimus dorsi.*
Serratus magnus.*
External intercostals.
Internal intercostals.

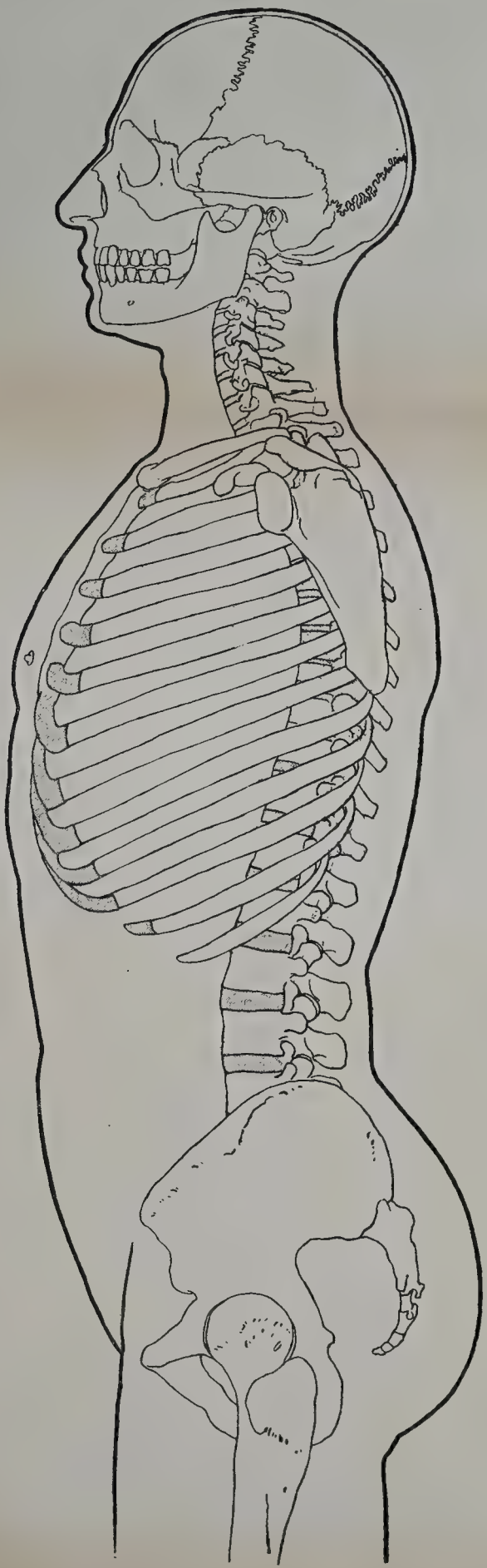
Arteries.

Intercostals.
- Anterior branches.
- Lateral branches.

Nerves.

Intercostals.
- Anterior branches.
- Lateral branches.

Plate 65.





BACK VIEW OF THORAX AND ABDOMEN.

Right Side.

Muscles.

Erector spinæ.
Sacro-lumbalis.
Longissimus dorsi.

Left Side.

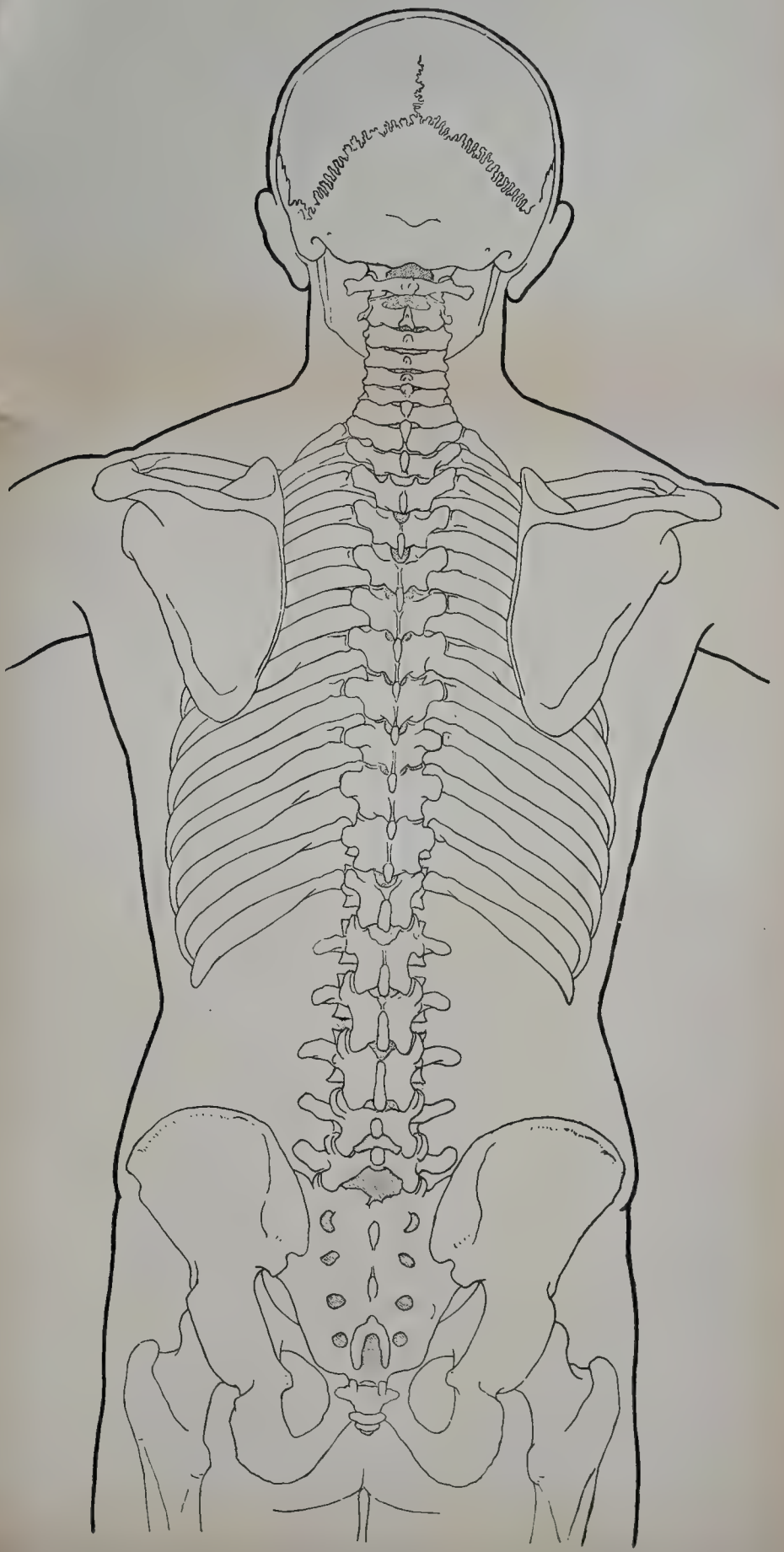
Muscles.

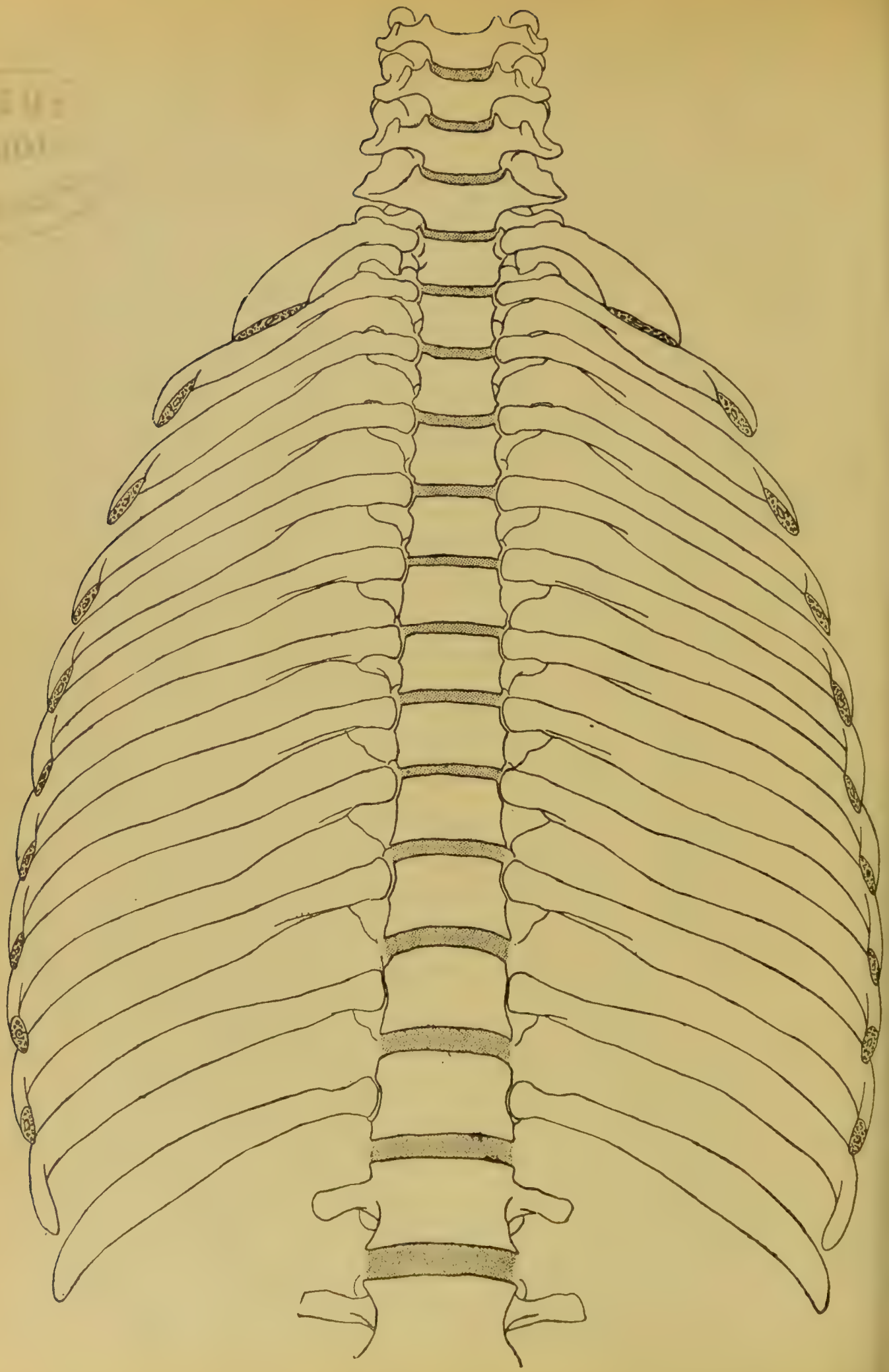
Quadratus lumborum.
Transversalis abdominis.
Accessorius.
&c. &c. &c.

Nerves.

Spinal (posterior branches).

Plate 66





SECTION OF THORAX.

I.

Muscles.

Intercostals.

Arteries.

Aorta.

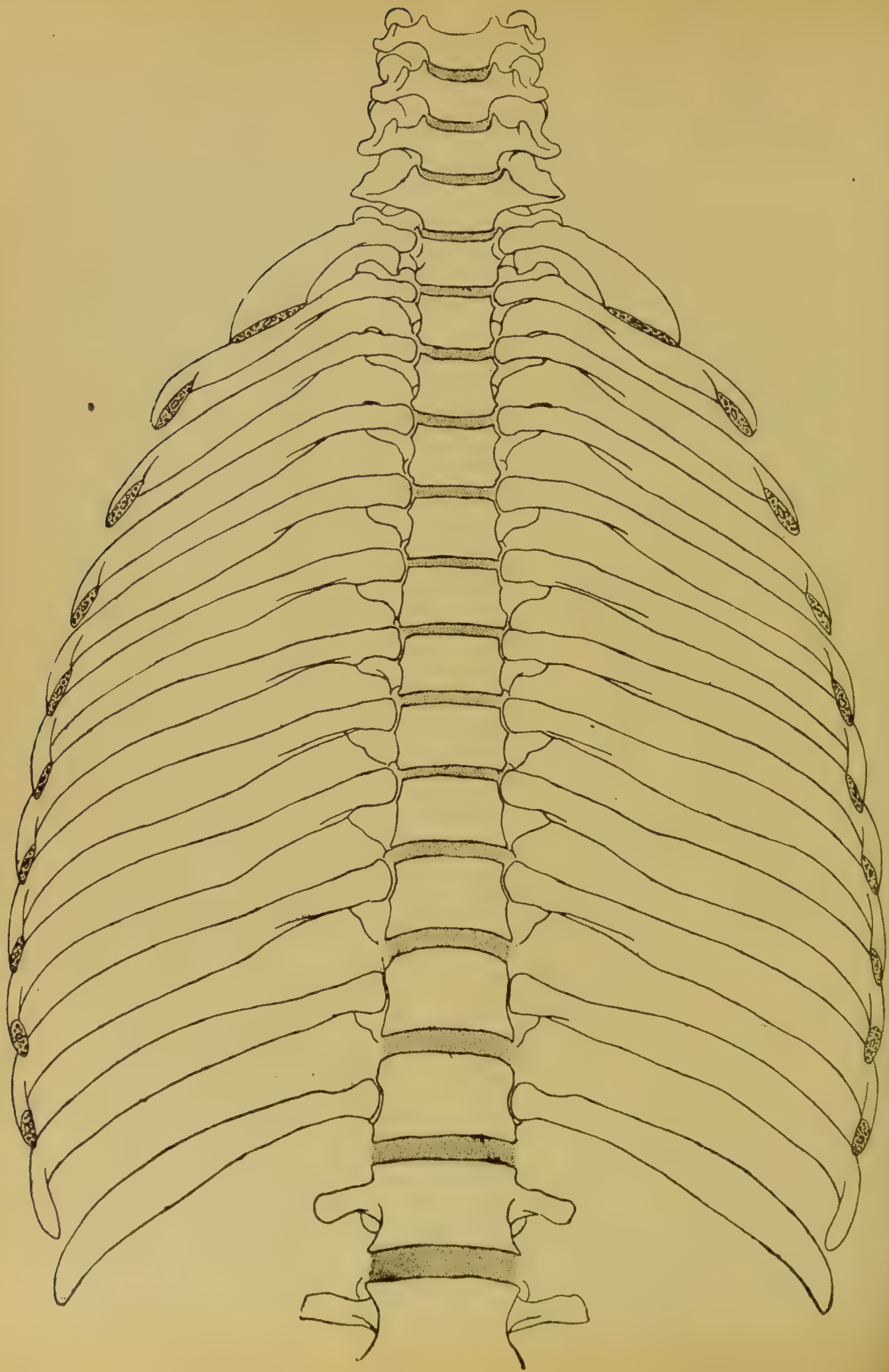
- Innominate.
- Carotid (left).
- Subclavian (left).
- Intercostal.

Veins.

Vena cava superior.

- Venæ innominatæ.

Plate 68.



SECTION OF THORAX.

II.

Veins.

Vena azygos major.
Vena azygos minor.
Right superior intercostal.
Left superior intercostal.
Left upper azygos.

Nerves.

Sympathetic.
Splanchnic.
Intercostal.

Thoracic duct.
Receptaculum chyli.

Plate 69.

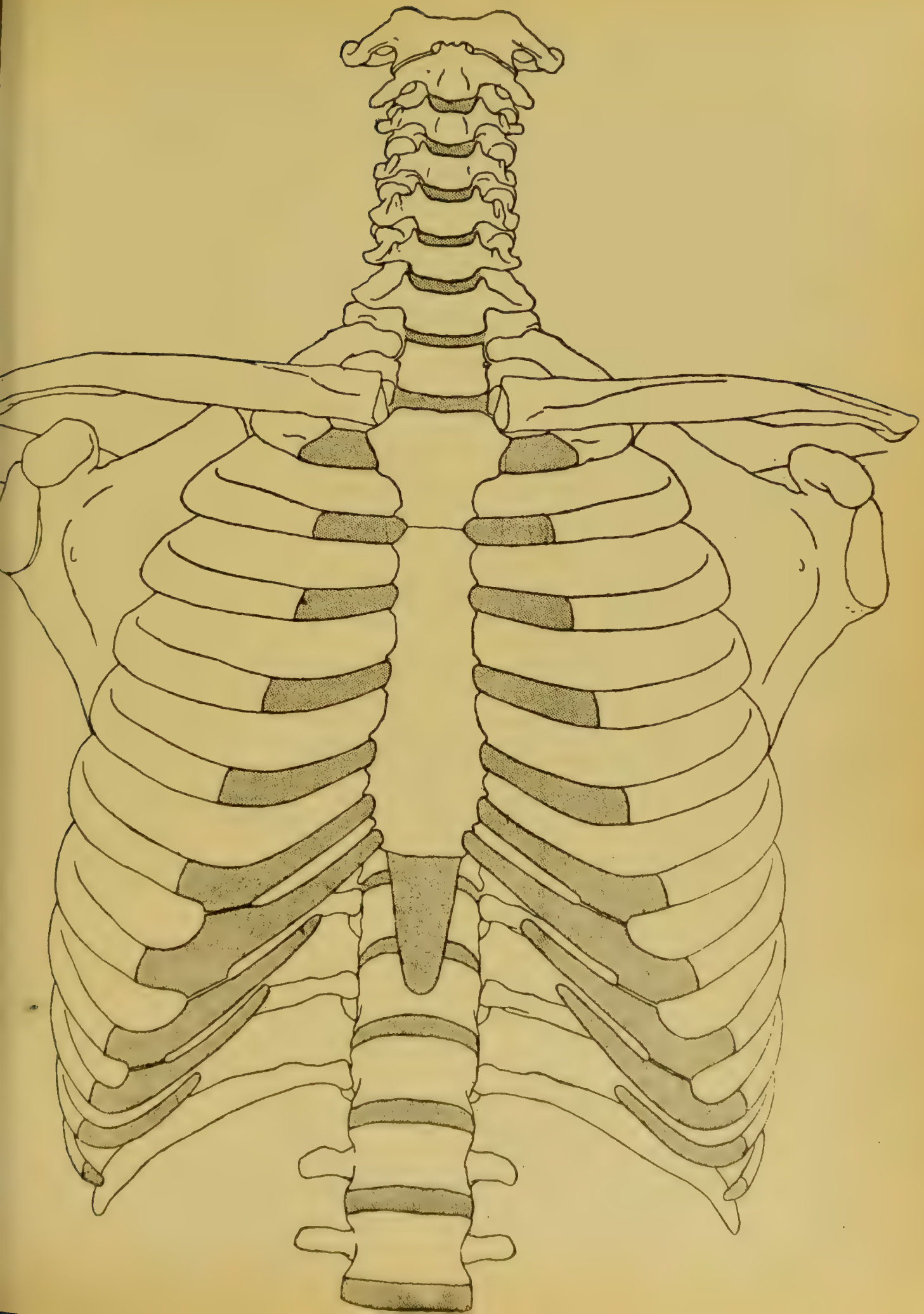
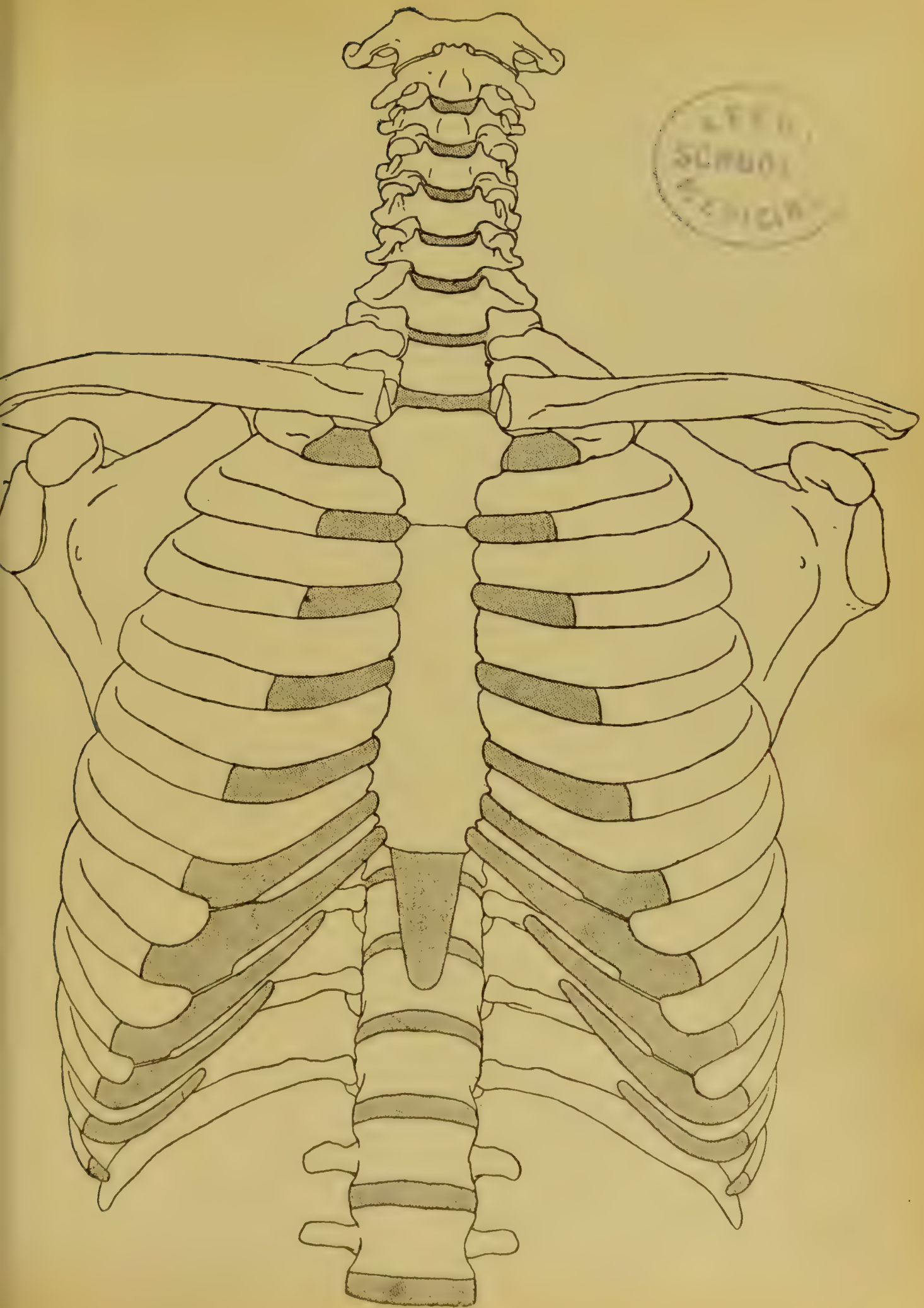


Plate 70.



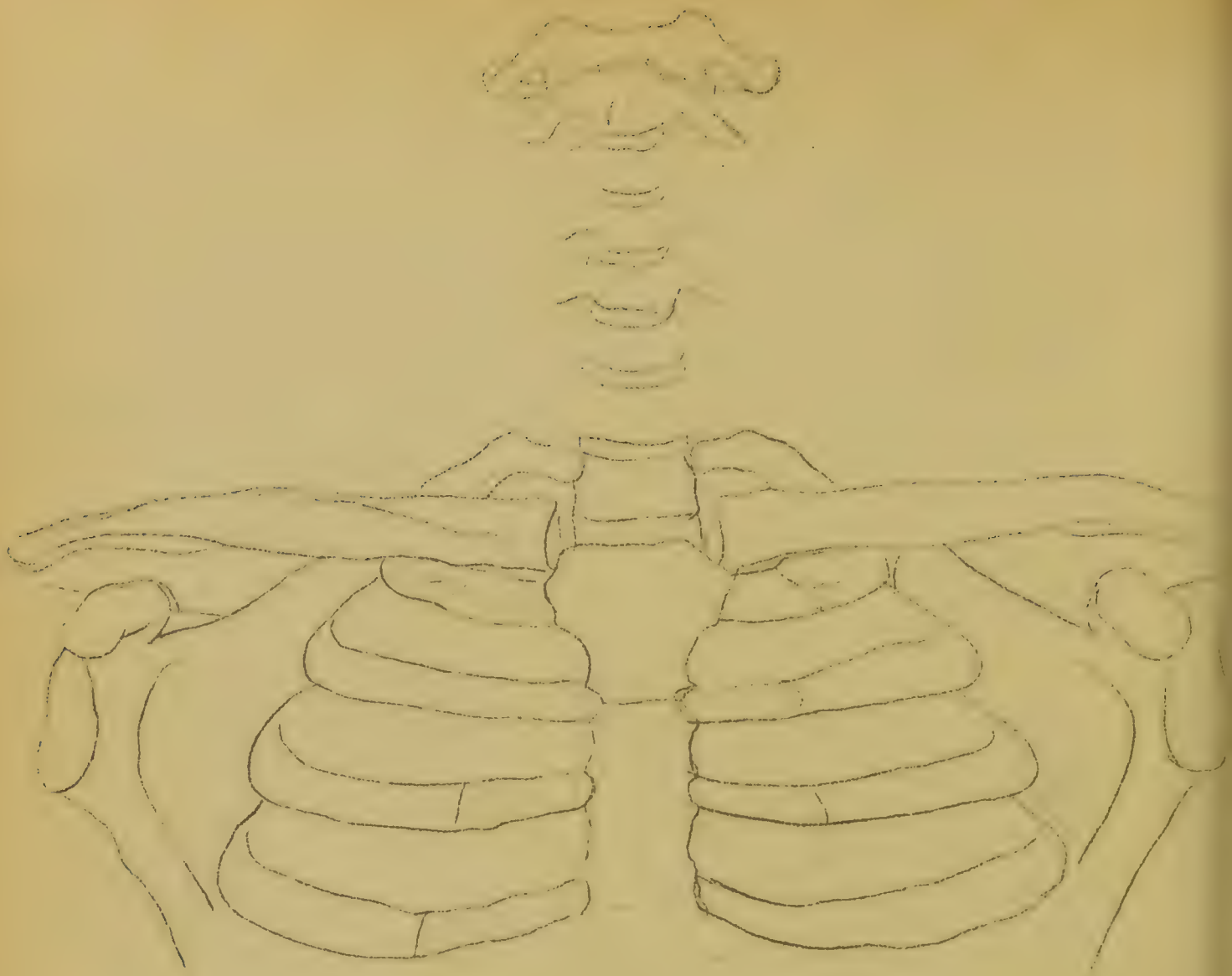


Plate 71.

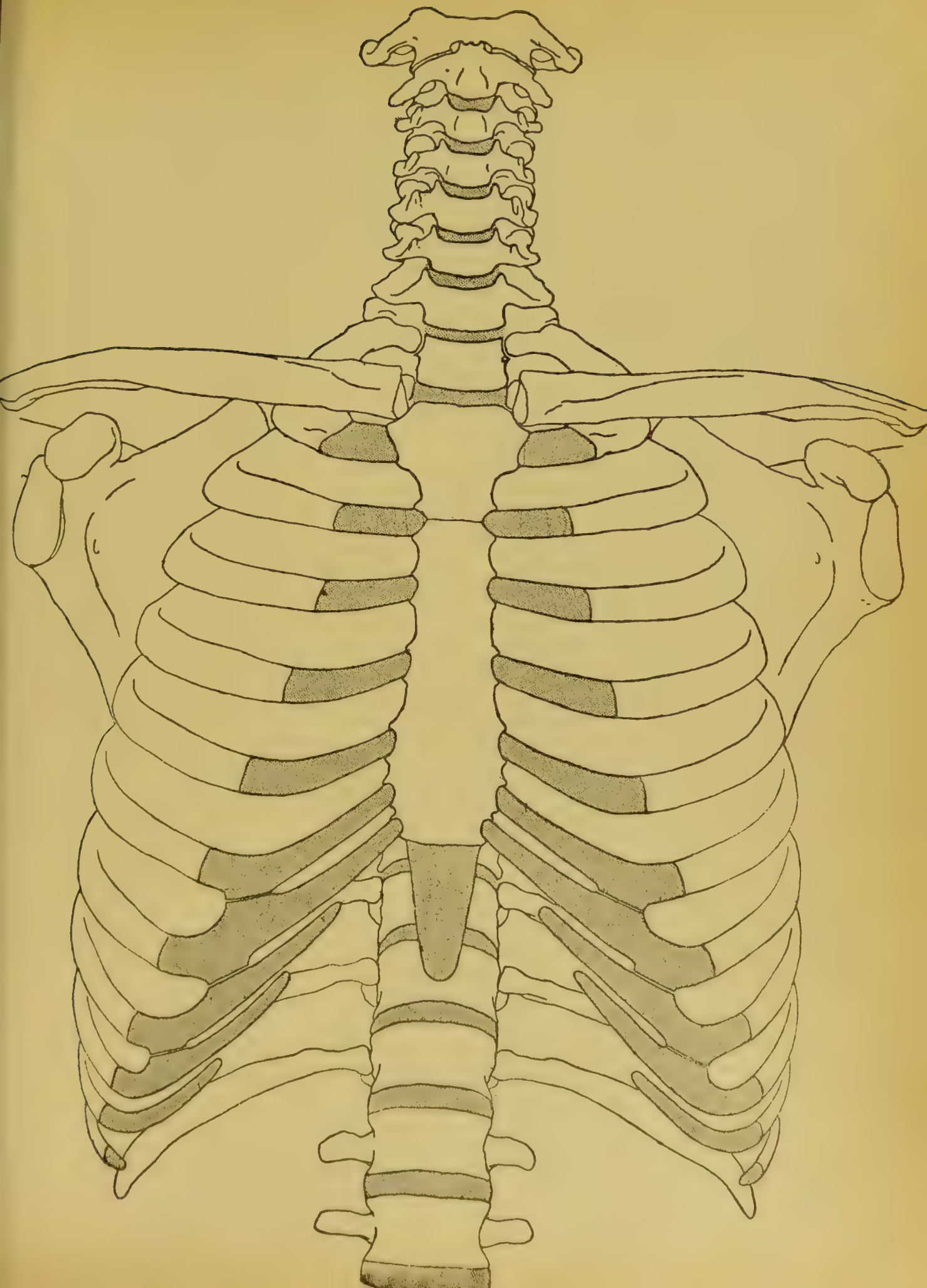
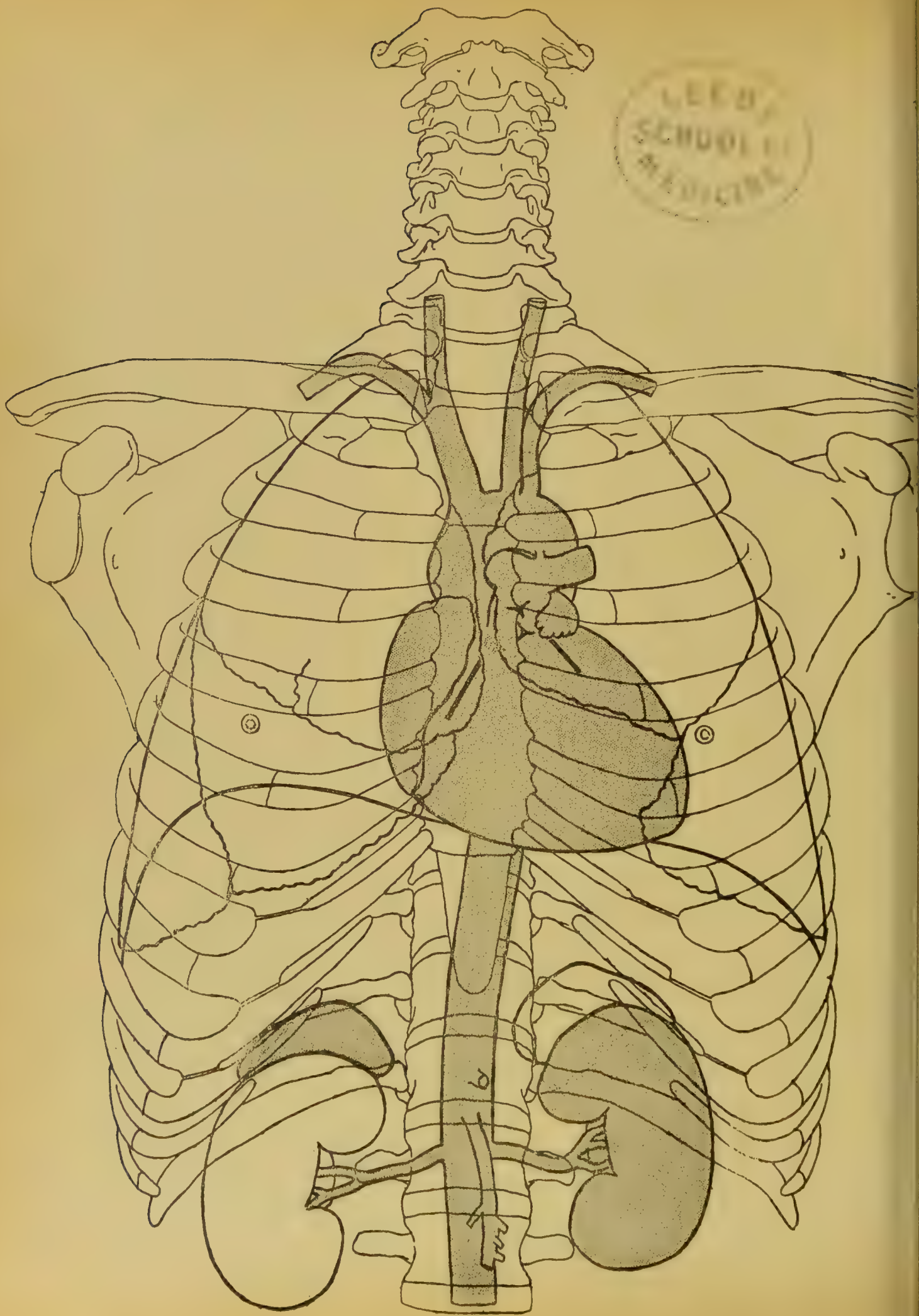


Plate 72.



FRONT VIEW OF THORAX WITH VISCERA.

I.

The *heart* may be mapped out in the following manner :—A line drawn across the sternum about the level of the third costal cartilages, passing half an inch to the right and one inch to the left, will indicate the position of the *base* from which the great vessels arise.

The *apex* usually strikes the chest wall between the fifth and sixth ribs on the left side, at a spot about a couple of inches below the nipple, and one inch to its sternal side.

The *lower border* is formed by the right ventricle, and rests on the central tendon of the diaphragm. It is defined by a line curving downwards, commencing at the apex and crossing close to the sterno-xiphoid articulation, and terminating at the right edge of the sternum near its junction with the sixth cartilage.

The *lateral borders* of the heart may be completed by drawing curved lines upwards from the points last named to the ends of the basal line. The right border consists entirely of right auricle and the left of the left ventricle.

The *pulmonary semilunar valves*, which are anterior in position to the aortic, are placed behind the junction of the cartilage of the third rib with the sternum on the left side.

The *aortic semilunar valves*, more deeply placed, correspond to the third space close to the sternum. The *tricuspid valve* is situated behind the sternum, near the middle line, about the level of the fourth costal cartilage. The *mitral valve* lies deeply behind the third intercostal space, one inch to the left of the sternum.

The *aortic arch* in the *first part* of its course extends from the left to the right behind the sternum. Starting from the third left interspace close to the sternum, it passes to the upper border of the second right cartilage (aortic cartilage) close to the sternum. The *second* or *transverse part* of the arch passes backwards, and to the left from the point last named to the left side of the body of the third dorsal vertebra. It crosses the trachea just above the bifurcation. At the middle of this course it reaches its highest point, about one inch below the top of the sternum.

The *third* or *descending part* passes to the lower border of the fourth or fifth dorsal vertebra on the left side, where it is arbitrarily said to become the thoracic aorta.

The *innominate artery* may be traced by a line passing from about the middle of the junction of the first and second piece of the sternum to the right sterno-clavicular articulation, where it divides into subclavian and common carotid branches. A corresponding line drawn to the left

joint fairly indicates the line of the left carotid artery. The *pulmonary artery* is a short trunk proceeding from a point opposite the junction of the third left cartilage with the sternum towards the upper border of the second left cartilage (pulmonary cartilage).

The *kidneys* are placed at the back of the abdomen, occupying the right and left lumbar regions. Their anterior surfaces look somewhat outwards as well as forwards. Their upper ends are the larger, and are nearer to the middle line.

The *right kidney* is in relation with the duodenum and colon in front, and touches the liver above.

The *left kidney* is covered by the colon and the tail of the pancreas, and touches the spleen above.

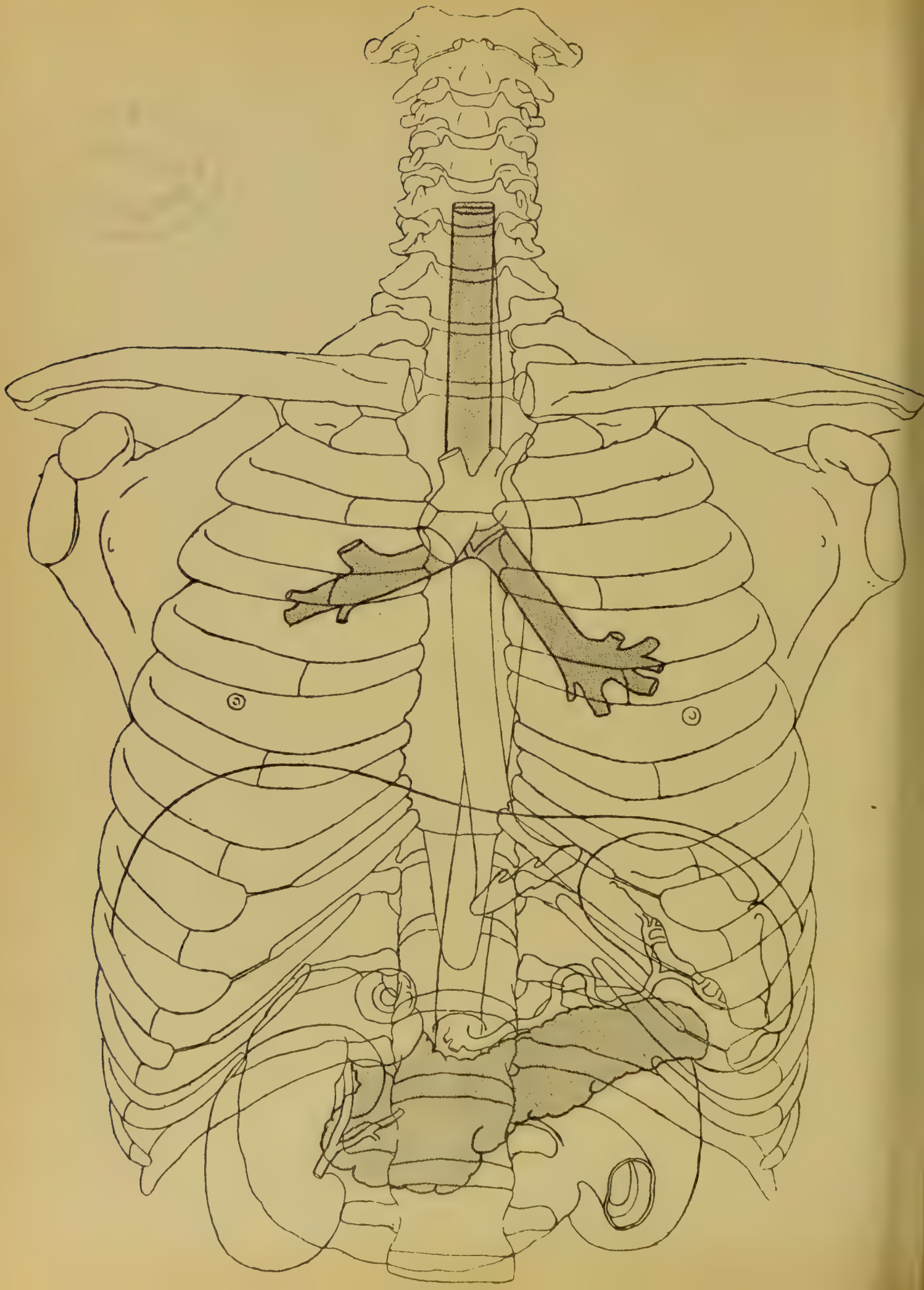
They are each surmounted by a supra-renal capsule, and are in contact posteriorly with the pillars of the diaphragm, psoas, and quadratus lumborum muscles.

The kidneys correspond in height to the two lower dorsal and two upper lumbar vertebræ. The left reaches as high as the upper border of the eleventh rib, whilst the right only reaches to the lower border.

They are movable organs, being slightly depressed by the diaphragm during a deep inspiration.

In this plate the *lungs* are represented with the *diaphragm* as they would appear in the dead body. The *aorta, supra-renal capsules* are also indicated.

Plate 73.



FRONT VIEW OF THORAX WITH VISCERA.

II.

The *œsophagus* is about nine inches long. It commences in the middle line opposite the lower border of the fifth cervical vertebra. In its course downwards it deviates slightly to the left at the root of the neck, but regains the middle line opposite the fifth dorsal vertebra. From this position it passes again to the left, and curving forwards reaches the opening in the diaphragm on a level with the ninth dorsal vertebra. The œsophagus, moreover, whilst in relation with the spine follows its curves. It is a closed tube when at rest, being flattened from before backwards.

The *trachea* is from four to five inches in length. It extends from the cricoid cartilage opposite the lower part of the body of the fifth cervical to the corresponding part of the fourth or even fifth dorsal vertebra. Here it divides into the two *bronchi*. The *right* bronchus is the larger, and about one inch in length. It passes almost transversely outwards, being the highest constituent of the root of the right lung. The left bronchus is about two inches

in length. It passes obliquely downwards into the lung below the corresponding pulmonary artery.

The *duodenum* is the largest part of the small intestine. It describes a curve somewhat resembling a horseshoe with the convexity to the right. The head of the pancreas is included within its curve.

The first portion is in contact with the liver, which overlaps it, and terminates at the neck of the gall-bladder. The second portion descends to about the level of the third lumbar vertebra, having the colon in front and the right kidney behind. The common bile duct opens into this part of the duodenum in common with the pancreatic duct.

The third portion crosses the spine and great vessels obliquely, the superior mesenteric artery passing downwards in front. It terminates on the left side of the body of the second lumbar vertebra.

The *pancreas* is placed obliquely across the abdomen opposite the second lumbar vertebra. Its head is embraced by the duodenum. The body is in contact with the spine, crura of diaphragm, and aorta, and its tail passes in front of the left kidney and supra-renal capsule, and touches the spleen. The pancreas lies behind the stomach.

In this plate the *spleen* and *splenic artery*, the *pyloric opening* of the *stomach*, *common bile* and *pancreatic ducts*, are also indicated.

in length. It passes obliquely downwards into the lung below the corresponding pulmonary artery.

The *duodenum* is the largest part of the small intestine. It describes a curve somewhat resembling a horseshoe with the convexity to the right. The head of the pancreas is included within its curve.

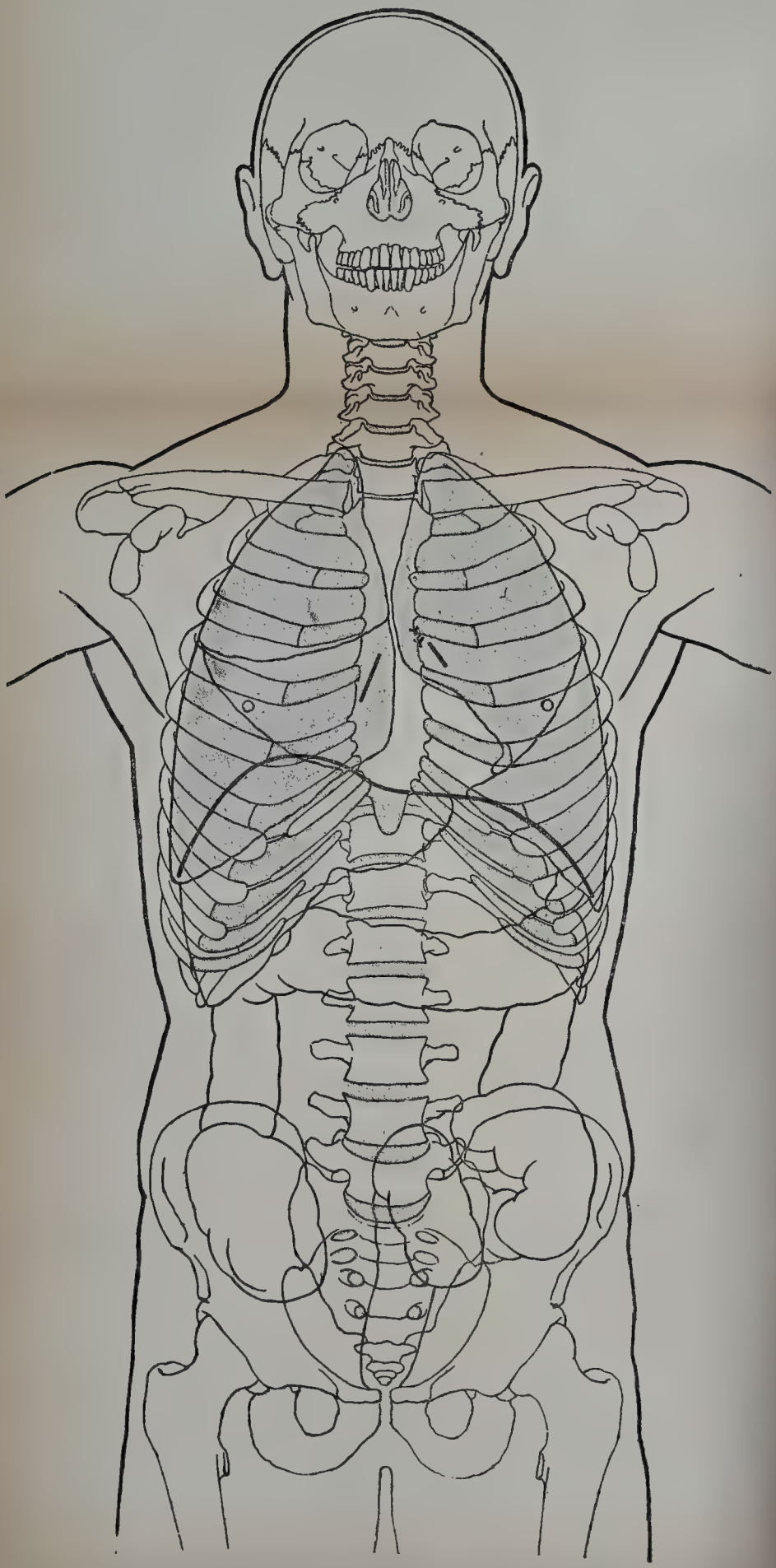
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In this plate the *spleen* and *splenic artery*, the *pyloric opening* of the *stomach*, *common bile* and *pancreatic ducts*, are also indicated.

Plate 74.



FRONT, BACK, AND SIDE VIEWS OF THORAX AND ABDOMEN, WITH VISCERA.

The *lungs*, when distended by an ordinary inspiration (as seen in those figures in which they are shaded), may be described as follows :—

The *apex* extends upwards for about one inch above the sternal end of the clavicle, fitting into the concavity of the arch of the subclavian artery. In this situation it is covered by the anterior scalene and sterno-mastoid muscles. The *anterior edge* passes from the apex to the sternal end of the clavicle ; thence it inclines inwards, reaching the median line at the junction of the first and second pieces of the sternum, i. e. on a level with the second rib cartilage. At this point it comes into close contact with the edge of the opposite lung, and the two run together behind the sternum as far as the level of the fourth costal cartilage. In this extent they are not quite parallel, for the right lung commonly bulges over to the left side. The edge of the *right* lung continues nearly in the midsternal line as far down as the level of the sixth cartilage, behind which it passes abruptly outwards, forming the commencement of the base.

The *left* lung leaves the midsternal line at the level of the fourth cartilage, passing obliquely downwards and outwards to the junction of the fifth cartilage with its rib ; thence it proceeds

inwards to the middle of the sixth, behind which it slopes outwards, forming the basal line. This *notch* in the left lung is of a quadrilateral shape, its lower boundary being formed by the liver (the diaphragm intervening). It leaves a considerable portion of the anterior wall of the right ventricle uncovered by lung and separated from the chest wall only by the pericardium. This is the præcordial region.

The *base of the right lung* passes outwards behind the sixth cartilage in front, reaching the level of the ninth rib in the midaxillary line. Behind, in the line of the inferior angle of the scapula it passes downwards as low as the tenth rib; being buoyed up by the liver, it does not extend so low down as the left base. This is level with the tenth rib in the midaxillary line and behind in the scapular line as low as the eleventh rib.

The *posterior borders* are separated along their whole length by a considerable interval, the front of the bodies of the vertebræ projecting, as it were, between them. A line drawn along the vertebral groove, about an inch external to the line of the spines from the first to the eleventh dorsal spinous processes, will map out the posterior border.

The *main sulcus*, dividing the lung into two lobes, passes from the anterior border near the base to the posterior border near the apex. To mark this on the surface of the body a line should be drawn from the junction of the sixth cartilage with the sternum obliquely upwards and outwards, crossing the fourth rib in the midaxilla. Thence it is to be prolonged upwards and inwards along the back, so that it may hit the posterior edge of the lung at the level of the third dorsal spinous process, the guide to which is the obtuse angle at the root of the scapular spine.

The upper division of the right lung is subdivided into two lobes by a fissure passing from the middle of the anterior border

to the middle of the main sulcus. This may be mapped out on the front of the chest by a line drawn from the fourth rib at the midaxilla to the midsternal line at the third costal cartilage.

The *diaphragm and its levels.*—The central tendon of the diaphragm supports the heart, portions of the right and left ventricles equally sharing this connection. This part of the muscle is lower than either of the lateral arches, and the right arch is about an inch higher than the left. The *surface line of attachment* proceeds from the tip of the xiphoid cartilage along the seventh cartilage and those of the remaining ribs to the first lumbar spine. The lungs being slightly distended, the *central tendon* is on a level with the sterno-xiphoid articulation. Measured from the front, the *right arch* reaches as high as the fifth cartilage. In the midaxillary line it is level with the ninth rib. Halfway between these points it reaches as high as the seventh rib ; and behind, in the scapular line, it is as low as the eleventh : 5, 7, 9, 11 is a useful clinical formula for this arch as well as for the upper limit of the liver, which fits into the concavity of its under surface.

The *left arch* in the midaxillary line is level with the tenth rib ; in front it reaches as high as the sixth cartilage.

In *tranquil inspiration* the arches descend for about half an inch, the central tendon remaining nearly stationary. In *forced expiration* the right arch extends upwards in front as high as the fourth cartilage. The left arch reaches up to about the fourth interspace.

The *spleen* is placed on the left side between the great end of the stomach and the diaphragm. It corresponds, when not enlarged, to the *ninth, tenth, and eleventh ribs* in the line of the axilla, but it varies in size perhaps more than any other organ in the body. The thin edge of the left lung overlaps it above. The

spleen *moves freely*, not only descending with the pressure of the diaphragm in *inspiration*, but altering its position according to the condition of the stomach and intestines. The enlarged spleen passes chiefly forwards, because it is buoyed up behind by the costocolic fold of peritoneum.

The following parts are also indicated in these Plates :— Liver ; Colon ; Rectum ; Apex of Heart (shaded) ; Cardiac end of Distended Stomach (shaded) ; Thoracic Aorta ; Abdominal Aorta ; Kidneys, Pancreas, and third portion of Duodenum ; Trachea and Bronchi.

Plate 75.

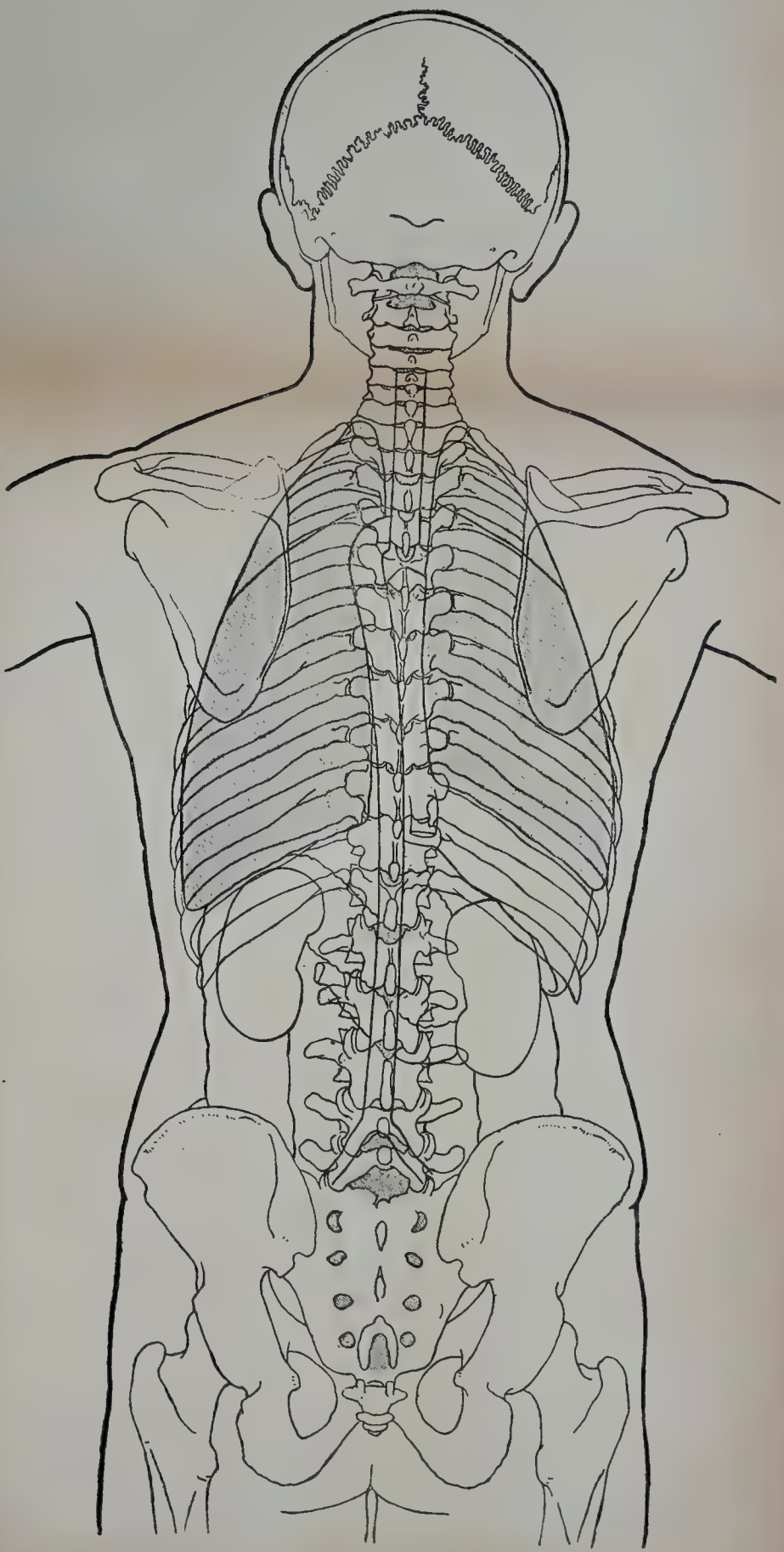


Plate 76.

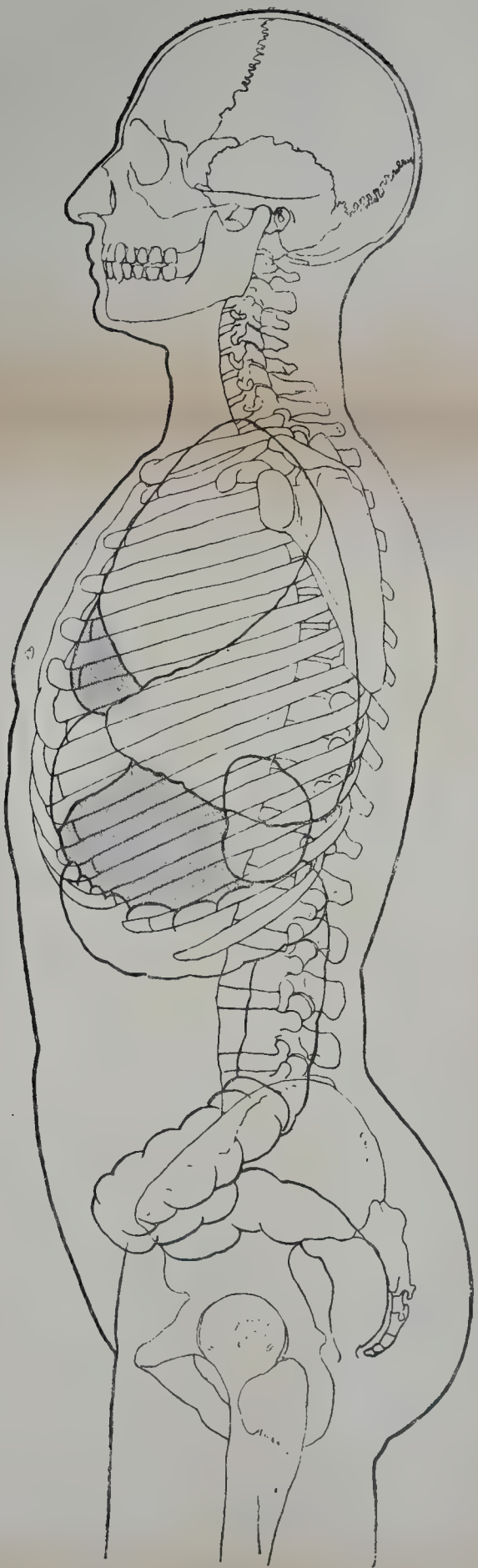
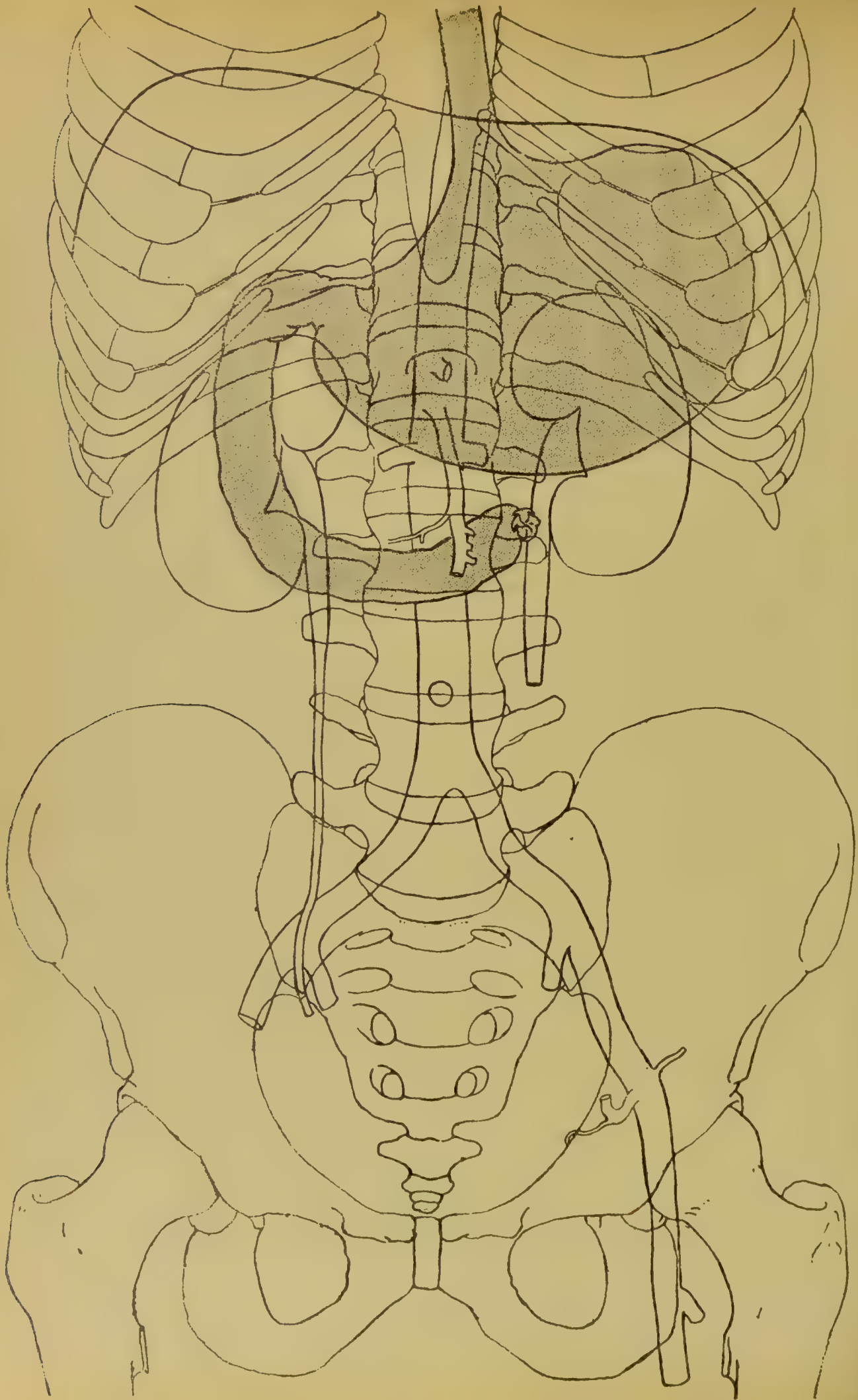


Plate 77.



FRONT VIEW OF ABDOMEN WITH VISCERA.

I.

The *stomach* varies very much in size. It occupies the three upper regions of the abdomen, but only a small portion of the left hypochondrium. It is placed beneath the diaphragm, the left lobe of the liver intervening near the pyloric end. When *distended* the stomach comes in contact with the abdominal walls in the epigastric region (pit of the stomach). The spleen lies to the *left*, the pancreas *behind*, and the colon *below*.

The *cardiac orifice* is comparatively fixed. It lies more deeply, and at a higher level than the *pyloric orifice*, which is much more movable.

As the stomach becomes distended the great curvature is carried forwards and upwards. The *lesser curvature* is subject to very limited movements, being steadily held in position by the lesser omentum.

The *cardiac orifice* lies to the left of the middle line, a little below the sternal end of the seventh costal cartilage.

The *pyloric orifice* lies to the right, a little below the end of the cartilage of the eighth rib. A line curving downwards to the right between these points will roughly indicate the line of the lesser curvature.

The *duodenum*, *kidneys*, *ureters*, with the aorta and some of its branches, are indicated in this plate.

FRONT VIEW OF ABDOMEN, WITH VISCERA.

II.

The *liver* is the largest of the abdominal organs. It occupies the three upper regions of the abdomen; its convex upper surface being chiefly covered by the vault of the diaphragm, but in front in the middle line it comes in contact for a variable distance with the abdominal parietes. *Above* the diaphragm the liver is overlapped by the thin margin of the right lung. It is in contact below with the pyloric extremity of the stomach, but if this organ be empty it covers it as far even as the cardiac end. The first portion of the *duodenum*, hepatic flexure of *colon*, the *right kidney* and its *supra-renal capsule*, are all in contact with the *under surface* of the right lobe.

The liver descends an inch or more in the *upright position*. In the *recumbent position* it ascends, and is almost hidden behind the lower ribs and their cartilages except in the middle line. This organ is depressed in *inspiration*, but it is raised upwards when the *stomach* or *intestines are distended*.

The fundus of the *gall bladder* corresponds to the ninth costal cartilage of the right side.

The *highest part* of the liver on the right side is level in front with the fifth rib cartilage at the nipple line. In the mid-axillary line it comes to the surface at the level of the ninth rib. Halfway between these points its upper border is level with the seventh rib. *Behind*, in the line of the inferior angle of the scapula, it comes to the surface at the level of the eleventh rib.

In the *median line*, and to the *left*, the upper border of the liver is contiguous to the lower border of the heart, only the tendon of the diaphragm intervening. On *percussion*, the areas of hepatic and cardiac dulness are continuous.

When the *stomach is undistended* it is covered by the left lobe of the liver, the lower edge of which is placed behind the linea alba, about halfway between the xiphoid cartilage and the umbilicus.

The *lower edge* of the liver may be marked on the surface by a line drawn from the tip of the tenth right cartilage, across the linea alba, at the level just mentioned, upwards to the tip of the ninth left cartilage.

The *large intestine*, about *five feet* in length, commences in the right iliac fossa, and terminates on the surface at the anus. In its arched course it surrounds the convolutions of the small intestine. It has been arbitrarily divided into *cæcum*—*ascending*, *transverse*, and *descending colon*, *sigmoid flexure*, and *rectum*.

The *cæcum* and *ascending colon* are placed superficially in the right iliac, lumbar, and hypochondriac regions.

The *descending colon* lies more deeply at the back of the abdomen, in the corresponding regions of the left side.

The *transverse colon* (arch of the colon) crosses the umbilical region in its passage from the left to the right hypochondriac regions. Here it is covered by the ribs, and is overlapped on the right side by the liver, and on the left comes in contact with the spleen.

The *sigmoid flexure* occupies the left iliac fossa, and the rectum is confined to the true pelvis.

The large intestine is capable of undergoing considerable distension. The transverse colon is very movable, so again is the sigmoid flexure.

According to Dr. Bright,[1] of all the viscera of the abdomen the colon is the one which varies most in its position.

[1] 'Observations on Abdominal Tumours.'—*Guy's Hospital Reports.*

Plate 78.

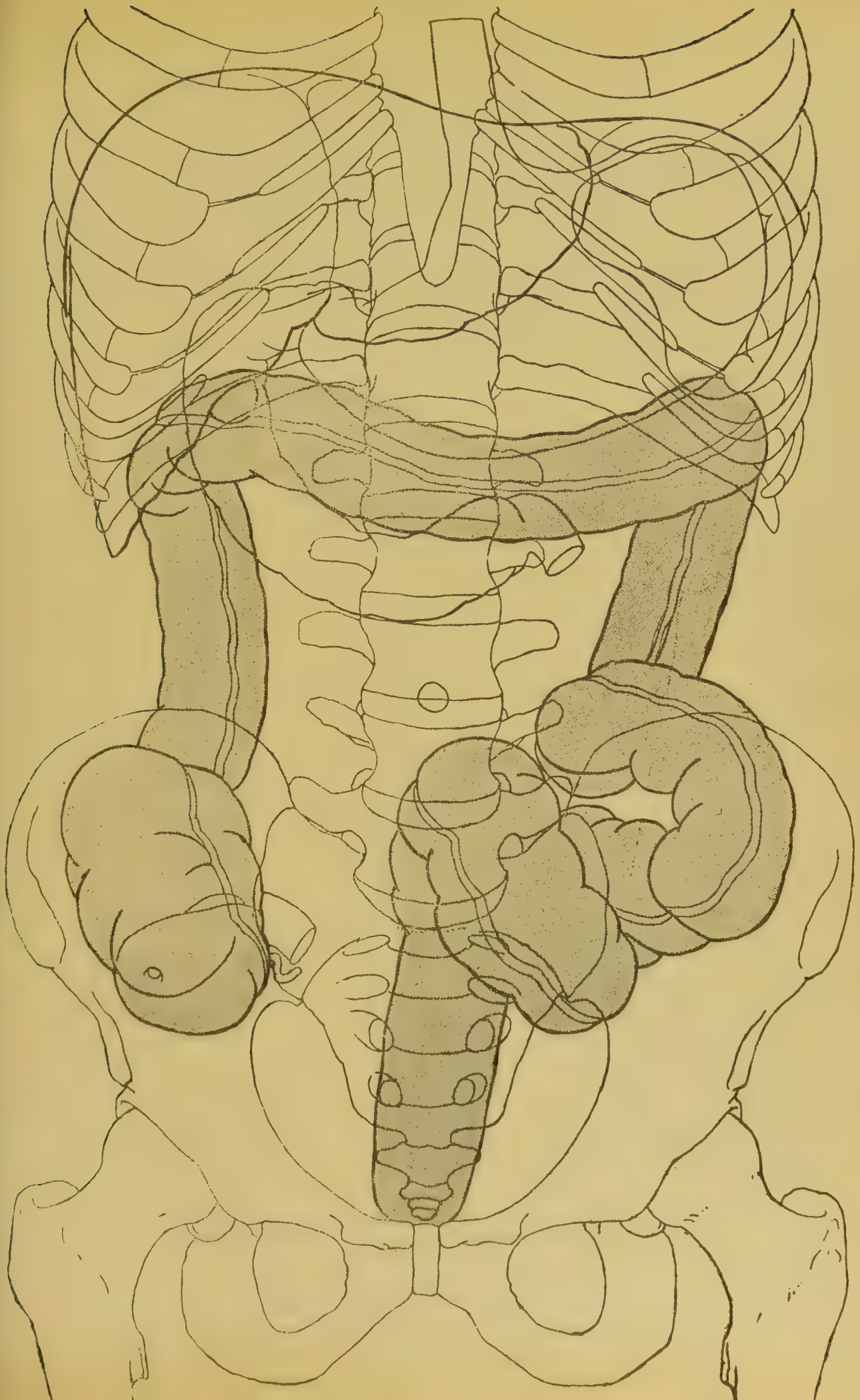
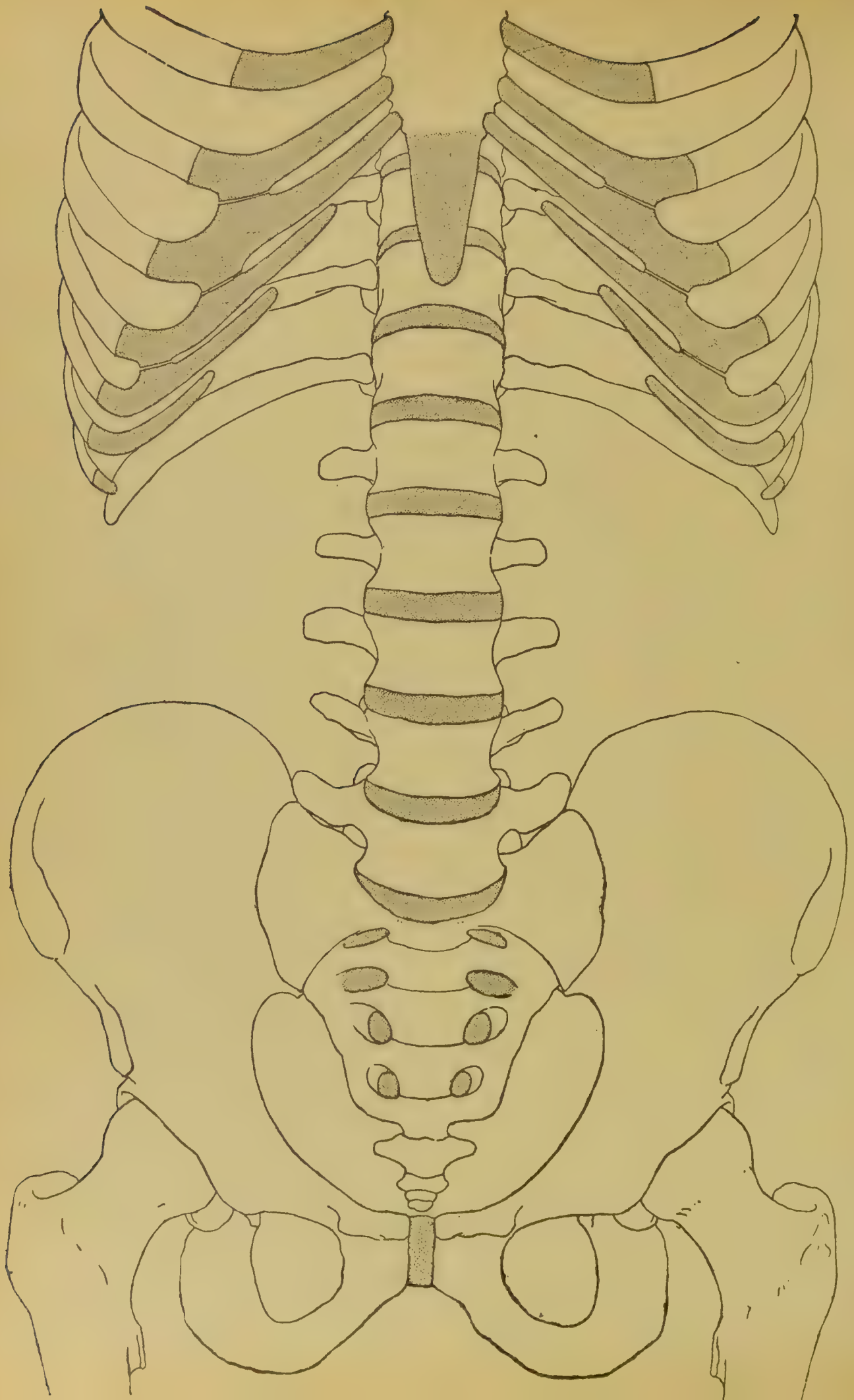


Plate 79.



FRONT VIEW OF ABDOMEN.

Right Side.

Muscles.

Pillars of diaphragm.

Psoas magnus.

Psoas parvus.

Iliacus.

Arteries.

Aorta (abdominal).

- Phrenic.
- Cæliac axis.
  - Gastric.
  - Hepatic.
  - Splenic
- Superior mesenteric.
- Supra renal.
- Renal.
- Spermatic.
- Inferior mesenteric.
- Lumbar.
- Sacra media.

Left Side.

Muscles.

Quadratus lumborum.

Nerves.

Lumbar plexus.

- Ilio-hypogastric (1).
- Ilio-inguinal (1).
- Genito-crural (2).
- External cutaneous (2).
- Obturator (3–4).
- Accessory obturator (3–4).
- Anterior crural (2, 3, 4).

Lumbo-sacro cord.

Sacral plexus

Plate 80.

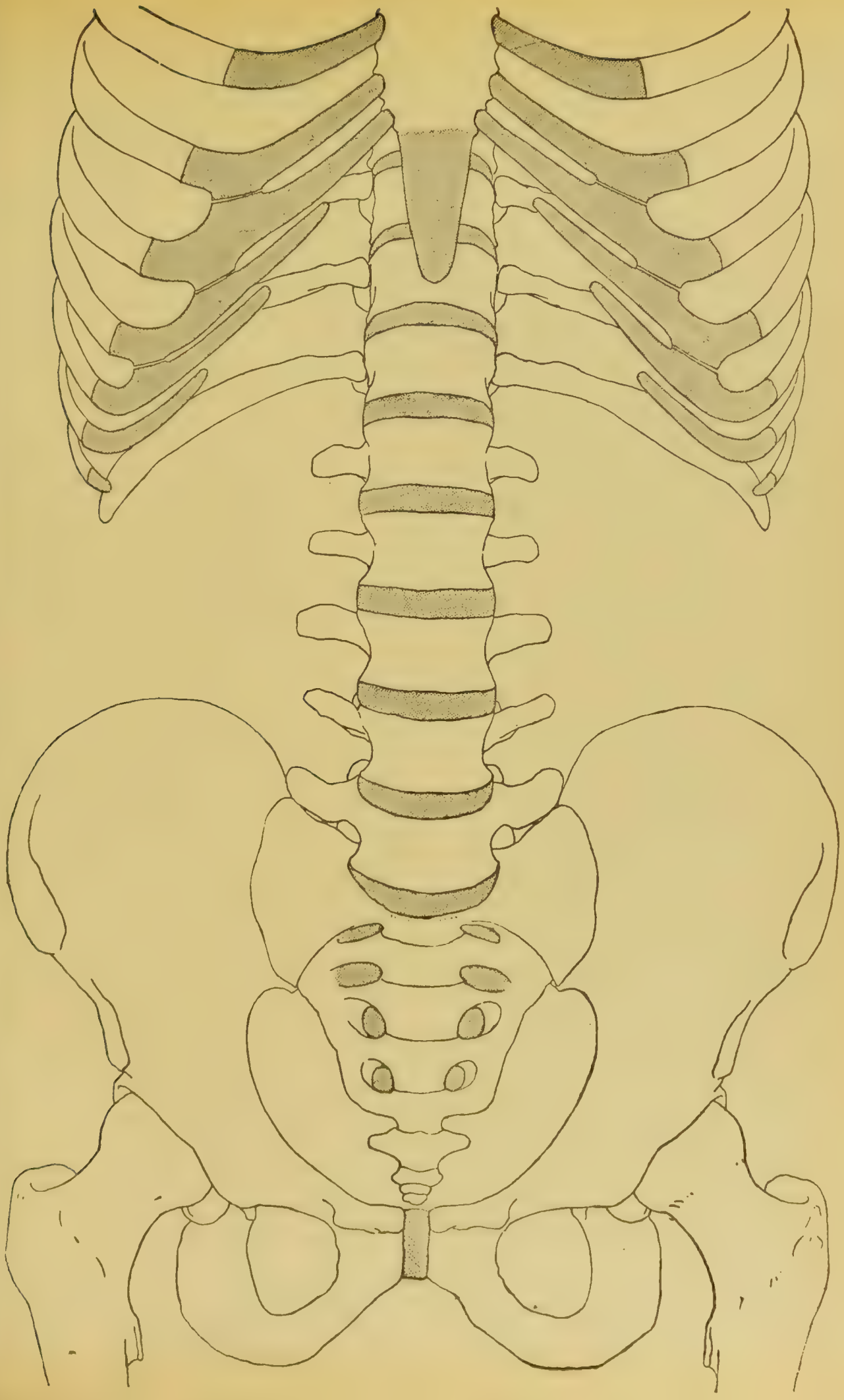


Plate 81.



SIDE VIEW OF PELVIS (MALE).

Muscles.

Obturator internus.
Pyriformis.

Arteries.

External iliac.
- Epigastric (deep).
- Circumflex iliac (deep).

Internal iliac.
- Superior vesical.
- Middle vesical.
- Inferior vesical.

Internal iliac—*continued.*
- Middle hæmorrhoidal.
- Obturator.
- Internal pudic.
- Sciatic.
- Ilio-lumbar.
- Gluteal.
- Lateral sacral.

Nerves.

Obturator.
Sacral plexus.

Plate 82.



Plate 83.



SIDE VIEW OF PELVIS (FEMALE).

Muscles.

Obturator internus.
Pyriformis.

Arteries.

External iliac.
Internal iliac.
- Superior vesical.
- Middle vesical.
- Inferior vesical.
- Middle hæmorrhoidal.

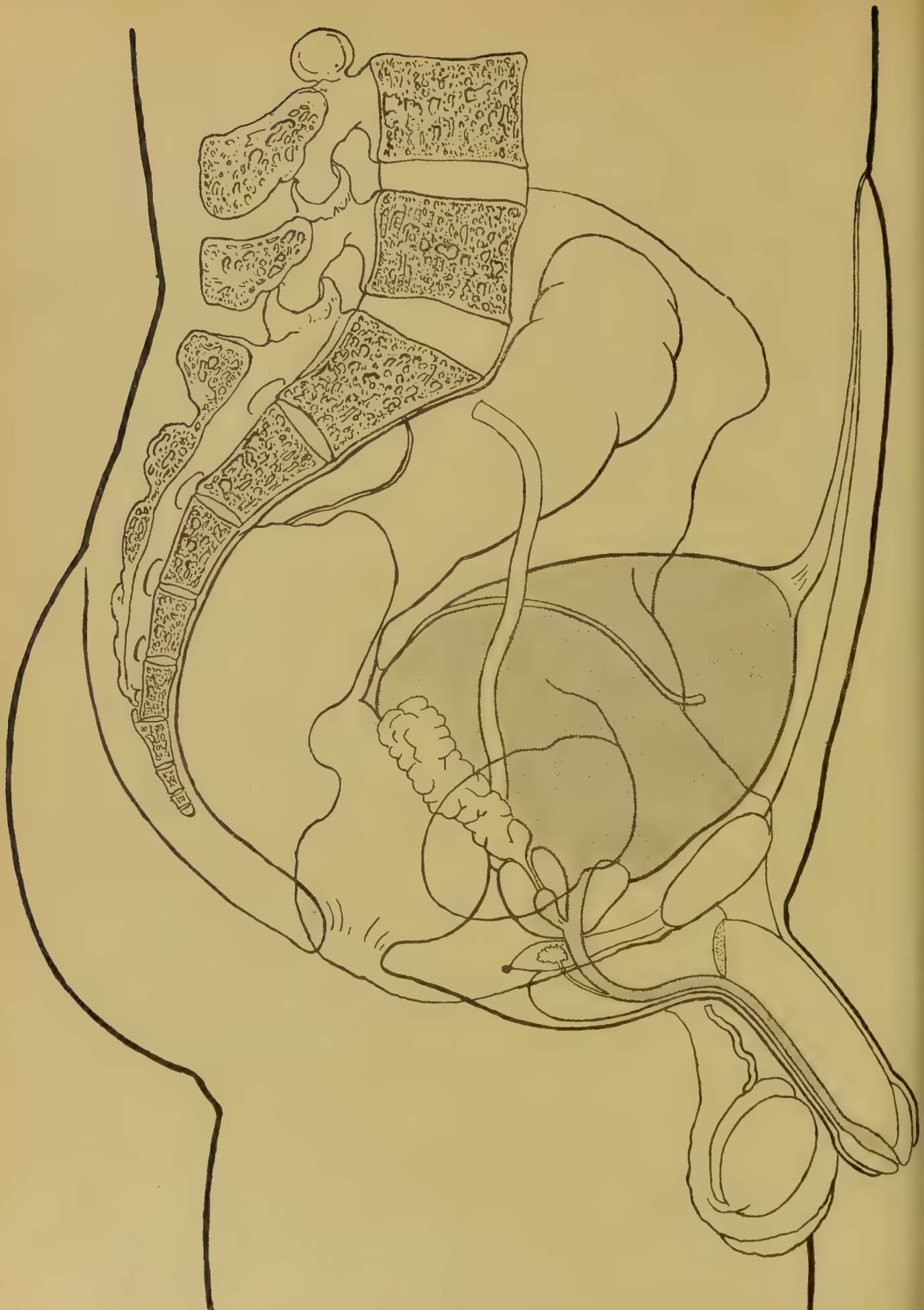
Internal iliac—*continued.*
- Obturator.
- Internal pudic.
- Sciatic.
- Uterine.
- Vaginal.
- Ilio-lumbar.
- Gluteal.
- Lateral sacral.

Nerves.

Obturator.
Sacral plexus.

Plate 84.





SIDE VIEW OF PELVIS WITH VISCERA (MALE).

The *rectum* is about *eight inches* long, extending from the sigmoid flexure of the colon to the anus. For convenience of description it is divided into *three parts.*

The *upper portion* is about *three and a half inches* long. It passes from the left sacro-iliac joint to the middle of the sacrum (third vertebral segment), and is the *narrowest* part of the gut. It is completely invested by a fold of peritoneum (meso-rectum) which connects it to the sacrum. In the *female* the recto-vaginal peritoneal pouch separates it from the back of the uterus and the upper part of the vagina. Below this the vagina is separated from the front of the rectum only by some loose areolar tissue. In the *male* the *recto-vesical pouch* intervenes between it and the back of the bladder. The lower end of this pouch is usually situated about two inches behind the base of the prostate, and double the distance from the anus. It is well, however, to remember that its position is not constant, for it is often much nearer the prostate. Hence puncture of the bladder per rectum is a hazardous operation, for should the pouch be pierced, death usually results. It is for these reasons many surgeons prefer supra-pubic aspiration to relieve the over-distended organ. Near the end of this portion of the gut on the right side is a projecting fold of mucous membrane, enclosing muscular fibres named *Houston's Fold.*

The *middle portion* of the rectum is continued downwards for about *three inches*, following the curve of the sacrum. It is covered by peritoneum for a short distance in front, and on each side, beyond this and in front, is *the trigone* of the base of the bladder, which is bounded *behind* by the end of the recto-vesical pouch ; on *each side* by the vas deferens with the seminal vesicle ; and *in front*, at its apex, by the base of the prostate. In *tapping the bladder* by the rectum, the point of the trochar is thrust through its upper wall and the trigone just behind the prostate. This part of the gut is usually distended. At its commencement, on the left side, is the second of Houston's folds. The first projects from the fore part of the middle of this portion of the gut, opposite the base of the bladder, and about three inches from the anus. In passing an instrument up the bowel, the position of these folds should be borne in mind.

The *lower portion* is about an inch and a half in length. From the anterior part of the prostate it curves backwards, round the tip of the coccyx to the anus. Here it is narrowest, but it is unduly dilated above. It has no peritoneal investment. Its lower end is surrounded by the sphincter and slung up by the levator ani. It presents several longitudinal folds (columns of Morgagni), due to the heaping up of longitudinal muscular fibres. At the junction of the skin and mucous membrane is a thickened white line. It corresponds to the interval between the internal and external sphincter muscles. The internal sphincter extends upwards beneath the mucous membrane for about an inch above the white line. The lower three inches of the rectum is supported and surrounded by a sheath derived from the recto-vesical fascia.

The *bladder* is placed in the fore part of the pelvis, close to its anterior wall. In the *empty* state it has a *triangular shape* :

but when *distended* it is *conical*, with the base below resting on the rectum, and the apex inclined upwards towards the abdominal wall. The top of the bladder is usually below the level of the pubes ; but when distended it rises out of the pelvis, and may reach as high or even higher than the umbilicus. The front part is not covered by peritonæum, so that when distended it may be cut into without wounding the membrane. In the female the bladder is separated from the rectum by the vagina and uterus ; but in the male, its base rests on the front of the middle portion of the rectum. This part of the viscus has a triangular shape, and corresponds with the smooth trigone of the inner surface. Its boundaries are described in connection with the rectum. The *ureters* pass obliquely through the walls of the bladder, opening into it at the extremities of the base of the trigone. There is an elevation of the mucous membrane and subjacent tissue, at the apex of the trigone, called the *uvula vesicæ*—it is caused by the projection of the middle lobe of the prostate. The median ridge of the *veru montanum* is prolonged forwards from the uvula. At its front end is the *sinus pocularis*, leading into the prostatic vesicle (uterus masculinus).

Just within the margins of the sinus are the slit-like openings of the *ejaculatory ducts*—one on either side. There is a shallow groove (*prostatic sinus*) on each side of the veru montanum ; at the bottom of this are numerous (12 to 20) small openings of the *prostatic ducts* ; those of the middle lobe open behind the uvula.

The *neck of the bladder* is a term rather loosely applied to the narrow anterior part adjacent to the urethra, where it is surrounded by the prostate. At the junction of its floor with the urethra is a well-marked projection, causing a narrowing of the urethra. This is the widest of the three urethral narrowings.

The *prostate* is a muscular and glandular body surrounding the neck of the bladder and the prostatic urethra. It is of a rounded three-sided shape, measuring about one inch and a half across, one inch and a quarter from base to apex, and one inch in thickness. Its *base*, which is thick and notched in the middle, is directed backwards, being situated between the apex of the trigone and the bend at the junction of the second and third pieces of rectum. Its *apex* passes as far forwards as the middle of the base of the triangular ligament. The prostate consists of two large *lateral lobes* and a smaller *middle lobe*, which is placed between these and the neck of the bladder. In old men this lobe often becomes hypertrophied, and projects forwards so as to narrow or almost close the urethral orifice. In this condition it impedes the passage of an instrument. The *urethra* passes through the gland near its upper surface, and the *ejaculatory ducts* pierce it obliquely to open into the urethra. This organ consists chiefly of plain muscular fibres, in which the sacculated glands and their elongated ducts are imbedded. Running backwards from the sinus pocularis for about a quarter of an inch beneath the middle lobe of the prostate is a cul de sac called the *prostatic sinus*. This is named also uterus masculinus, being homologous with the female uterus. The prostate has a *capsule* of its own as well as a *special sheath*, derived from the recto-vesical fascia. Between these investments there is a quantity of loose areolar tissue and the *prostatic plexus* of veins, which receives in front the dorsal vein of the penis.

Its *upper surface* is in relation with the neck of the bladder—with the pubo-prostatic ligaments and dorsal vein of the penis. About two inches behind its base and rather above it is the lower end of the recto-vesical pouch. Its *base* is placed on the fore part of the rectum, at the bend between its second and third portions.

At the apex of the trigone it is in contact with the *vesiculæ seminales* and the *vasa deferentia*. On passing the finger into the gut for about two inches, the prostate can be felt as a hard projection through the front wall of the rectum.

Its *apex* surrounds the urethra, and is connected to the posterior deep layer of the triangular ligament. A little distance in front of it is the bulb of the corpus spongiosum.

Its *under surface* corresponds to the central perinæal raphé and central point of perinæum. It is supported by the anterior fibres of levator ani (levator prostatæ).

On *each side* the anterior fibres of the levator ani pass down to unite beneath it in the middle line.

SIDE VIEW OF PELVIS WITH VISCERA (FEMALE).

In this plate the *uterus*, with the *ovary* and *Fallopian tube*, *vagina*, *rectum*, &c. &c., have been introduced in outline.

Plate 86.



Plate 87.



PERINÆUM.

I.

Muscles.

External sphincter.
Internal sphincter.
Levator ani.
Coccygeus.
Gluteus maximus.

Arteries.

Inferior hæmorrhoidal (internal pudic).
Superficial perinæal (internal pudic).

Nerves.

Inferior hæmorrhoidal (internal pudic).
Superficial perinæal (internal pudic).
Branches of small sciatic.

II.

Muscles.

Accelerator urinæ.
Erector penis.
Superficial transverse.

Arteries.

Superficial perinæal.
Transverse perinæal.

Nerves.

Superficial perinæal.
Inferior pudendal (Sœmmering) (small sciatic).

PERINÆUM—continued.

III.

Bulb.

Crus.

Triangular ligament (anterior layer).

Arteries.

Internal pudic (internal iliac).

Cavernous.

Dorsal of penis.

IV.

Muscles.

Deep transverse.

Constrictor.

Arteries.

Internal pudic.

Artery to bulb.

Membranous urethra.

Cowper's gland.

Plate 88.

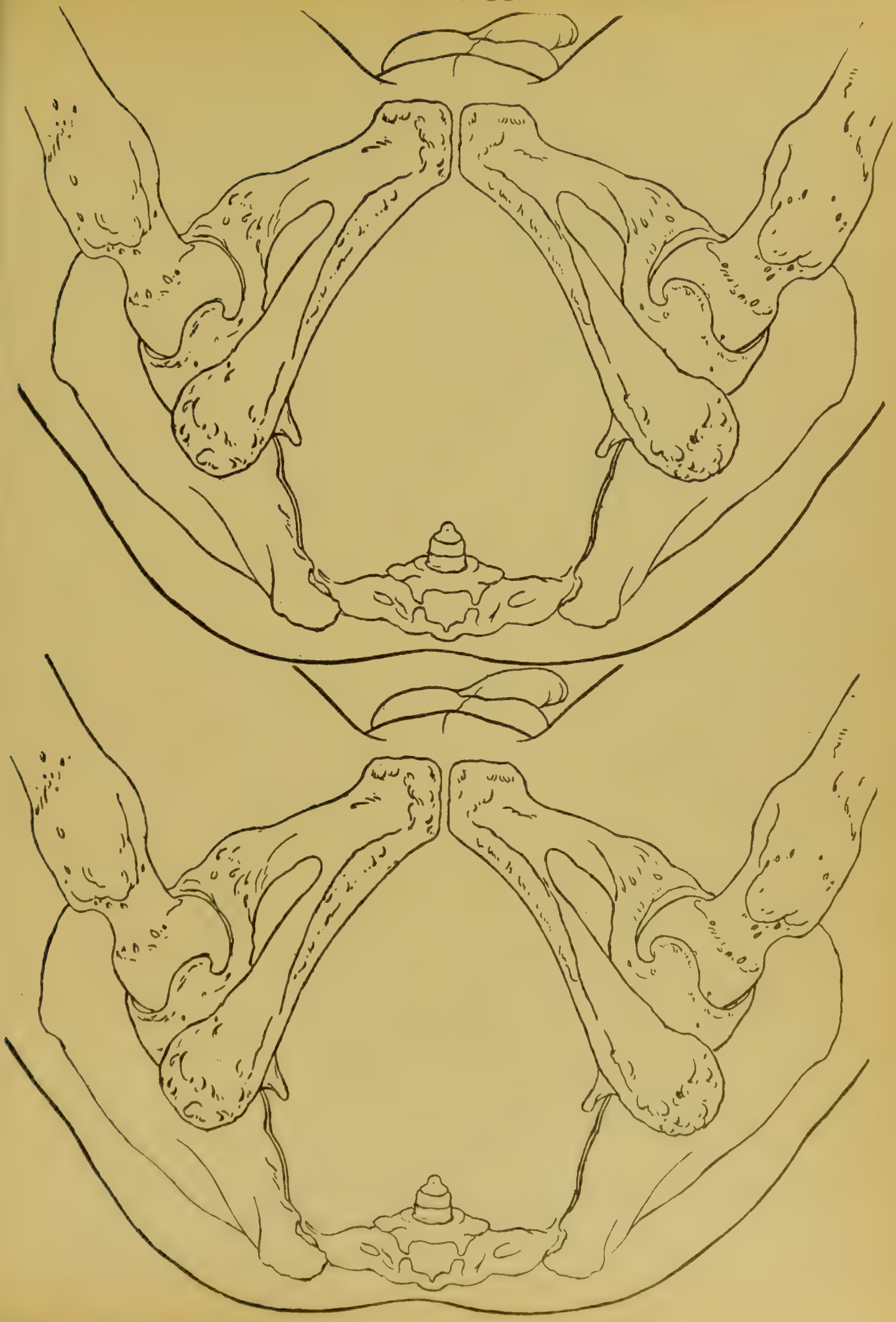
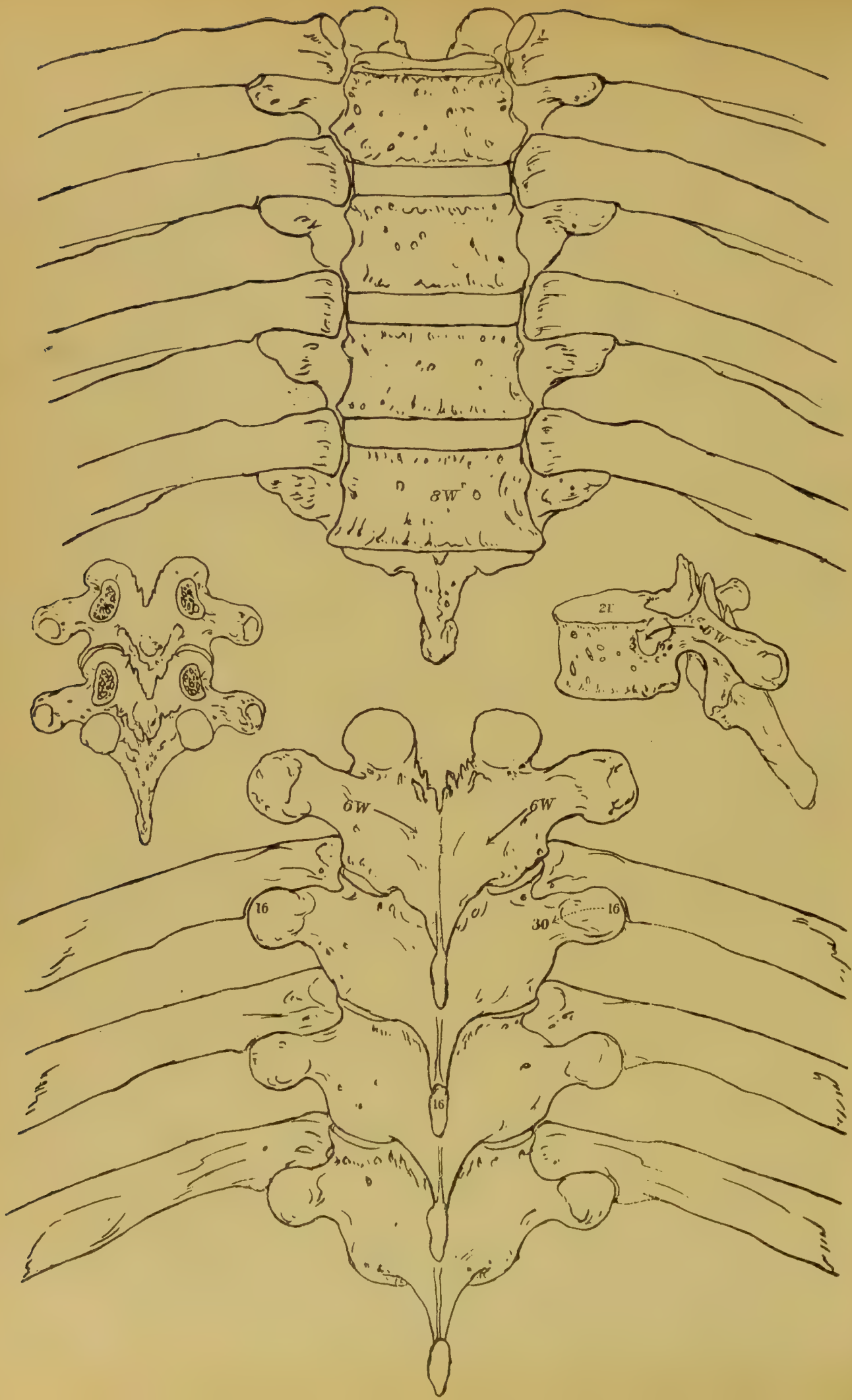


Plate 89.



LIGAMENTS OF VERTEBRAL COLUMN AND RIBS.

Vertebral Column.

Anterior common.
Intervertebral discs.
Capsular.
Ligamenta subflava.
Supraspinous.
Interspinous.
Intertransverse.

Ribs with bodies.

Anterior costo-central.
Interarticular.

Ribs with transverse processes.

Superior costo-transverse.
Middle costo-transverse.
Posterior costo-transverse.

NOTE.—The position and number of the centres of ossification, and the time at which they appear, are indicated by figures. The centres which appear *before birth* are shown by figures in *italics*. They denote the time in *months* except when followed by a W, when *weeks* are intended. The *upright* figures denote *years*. The solid arrows → show the mode of union of these centres one with another. The time at which this takes place is indicated by figures between their points. The dotted arrows .....> point to the period when the secondary centres unite with the primary.

ANATOMICAL OUTLINES

PART IV.

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ANATOMICAL OUTLINES

FOR THE USE OF STUDENTS IN THE DISSECTING ROOM

AND SURGICAL CLASS ROOM



BY

ARTHUR HENSMAN

SENIOR DEMONSTRATOR OF ANATOMY AT THE MIDDLESEX HOSPITAL

WITH ORIGINAL DRAWINGS by ARTHUR E. FISHER

PART IV.—THE HEAD AND NECK

CONTAINING TWENTY-SEVEN PLATES, WITH EXPLANATORY TABLES

LONDON

LONGMANS, GREEN, AND CO.

1880

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TO

ROBERT LIVEING

DOCTOR OF MEDICINE

LECTURER ON DERMATOLOGY AND LATE LECTURER ON ANATOMY

AT THE MIDDLESEX HOSPITAL

THESE ANATOMICAL OUTLINES

ARE DEDICATED

AS A SLIGHT TOKEN OF ADMIRATION FOR HIM AS A

PRACTICAL TEACHER AND ESTEEM FOR HIM

AS A COLLEAGUE AND FRIEND

PREFACE

TO

PART THE FOURTH.

THE PURPOSE of these Outlines has been fully explained in earlier Parts. It has been thought well, however, to introduce again the suggestions made under the heading of 'Advice.' The criticisms which have appeared in the press, together with the opinions with which the author has been favoured from teachers and scientific men, have fully satisfied him that in undertaking the present work he was endeavouring to supply a real want.

The acceptance of the plan as a recognised aid to the student must in the first instance mainly rest with those teachers who from day to day guide his labours in the dissecting-room and class-room. The following method has been found by the author to work satisfactorily: The teacher having previously filled in the outline, makes from it a few tracings for the use of his class. He demonstrates the region from a recent dissection, carefully noting the attachment of the muscles, their nerve supply, and the course and relations of the vessels, &c. Most of these points he may arrange in the form of tables on the black board, and these should be copied by the class. When the region has been fully explained, and the teacher is satisfied by oral examination that he has been understood and his facts

mastered, the outline may be filled in. The dissection or the teacher's own outline will serve as a copy, or the tracings may be used by those students who possess but slight knowledge of drawing. The outlines may be coloured in or more highly finished before the class meets again. By this plan, when a student commences his dissections, he has already overcome many of his difficulties, and he will be better able to fill in the outlines from his own dissections.

The author must express his best thanks to Messrs. Longman and Co. for their willing efforts to issue the work at a very moderate cost, and to Messrs. Leitch and Co. for the care they have bestowed on the plates. He must again express his obligations to his friend Mr. A. E. Fisher for his generous assistance, without which the cost of the Parts must have been largely increased. To his friend and colleague in the dissecting-room, Mr. J. Bland Sutton, he owes much for his valuable assistance and advice.

33 Harley Street, Cavendish Square, W.
April 12th, 1880.



ADVICE.

The student is advised, after commencing the dissection of a region, to indicate on the 'outline' the incisions he has made in order to reflect the skin. In this way the part he is about to fill in is marked out, and he follows with his pencil the incisions he has previously made with his scalpel.

It will be well, as his dissection progresses, first to outline the muscles, having previously ascertained as far as possible their exact attachments by dissection. Their general shape and superficial limits may be shown by *continuous* lines; their attachments beneath, which are often ascertained best after division, may be shown by *dotted* lines.

The arteries, important veins, and nerves may then be added. Wherever these are hidden by overlying structures, their course can be indicated by dotted lines. At his leisure he may complete his drawing. This is most satisfactorily done by using for the muscles thin washes of transparent colours. The arteries and veins may be shown in darker tints. The ligaments and tendons may be coloured with *gamboge*, and the nerves afterwards picked out with Chinese white, or with some other colour.

If the deeper muscles be coloured in with a wash of *blue*, and those more superficial with a wash of *lake*, a transparent drawing is made, which will show not only the origin and insertion of the muscles, with their deeper connections, but the relation of all these to the skeleton beneath, and often their bearing on surface form.

The structures which it is thought expedient to portray in each

region are named opposite each outline. The student, however, can follow to a certain extent his own taste in this matter. If he be skilful with his pencil or brush, he can introduce into a single outline several layers of muscles by means of transparent washes.

He can, if he chooses, finish some of the outlines more highly.

Those who have but little knowledge of drawing can mark the origin and insertion of muscles, and indicate the course of the principal vessels and nerves by mere strokes. Such a method may be rough, but it is clear and simple, and will be a great help to the memory, particularly where a muscle has wide attachments, or when it arises from several bones.[1]

As the 'Outlines' are designed to show the human body, as a whole rather than in parts or regions, the student can in many instances work beyond his special dissection. He may carry out the same method, or may vary the process, as he finds best. The lines he first makes to limit his drawing will not interfere with this plan; but he should remember that those structures alone are named which are fairly contained within the limits of a given region, and which can be wholly or in part indicated with clearness and advantage. Should he utilise the whole outline in this manner, the dissections before him will be the best guides, and he will be safe in following them. A list of the structures, which may be filled in, faces each outline. Those muscles printed in *italics* indicate that they are for the most part, or entirely, hidden by superficial structures.

An asterisk following a muscle is intended to show that it is removed. It is named again in order to remind the dissector that he will do well to mark again its attachments. He may use *red* for the origin and *blue* for the insertion. Coloured ink, used with a pen, will make his work neat and rapid.

Filling in an outline will be found an excellent test of growing knowledge, and by this simple method he will do much, as his facts accumulate, to save the drudgery of incessant repetition. If he be dissecting a right limb, he can use the outlines of the left for this purpose, as well as for recording occasional abnormalities.

[1] The Trapezius is a good example of the first condition, and the Flexor Brevis Pollicis of the second.

The blank pages will be found useful for the registration of notes or hints he is certain to gather whilst at work.

Lastly, he should bear in mind that no two bones are exactly alike. They differ as widely as human faces. The author has endeavoured to choose typical examples. He has tested all the doubtful points on the dead subject by comparison as far as possible with the living. In no case has the artist trusted entirely to the fancy of the articulator.

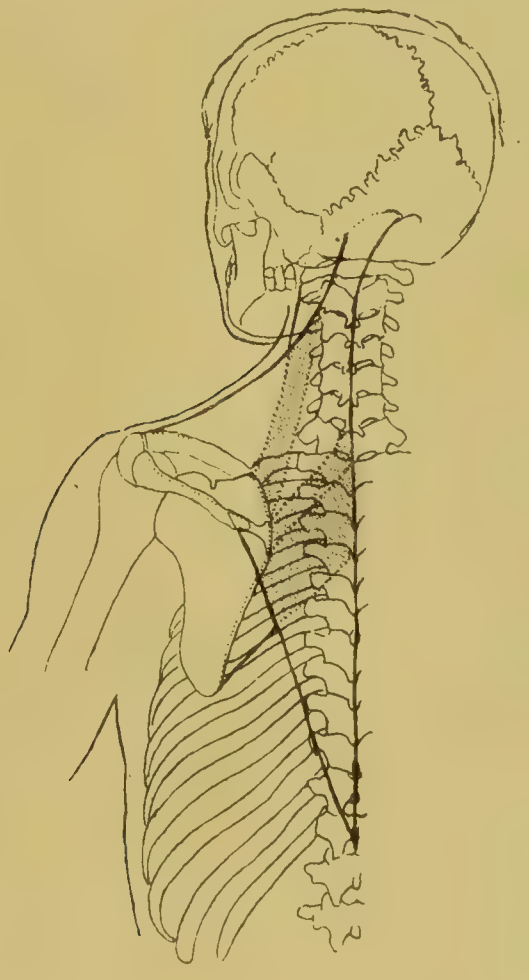
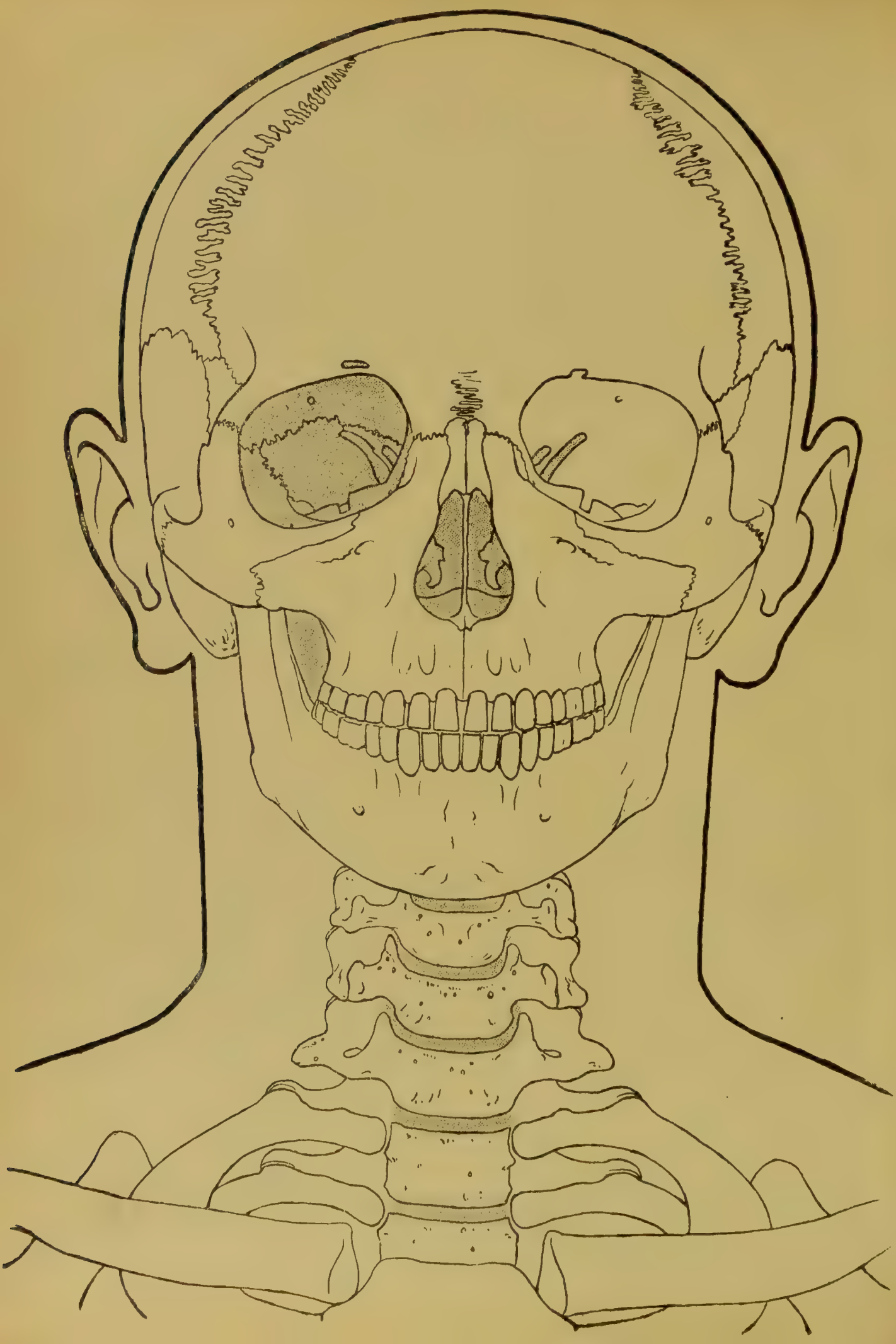


Plate 90.



FRONT VIEW OF HEAD AND NECK.

RIGHT OR LEFT.

Muscles.

Occipito-frontalis (frontal portion).
Orbicularis palpebrarum.
Pyramidalis nasi.
Compressor naris.
Levator labii superioris alæque nasi.
Levator labii superioris.
Zygomaticus major.
Zygomaticus minor.
Orbicularis oris.
Depressor anguli oris.
Depressor labii inferioris.
Buccinator.
Masseter.

FRONT VIEW OF HEAD AND NECK.

RIGHT OR LEFT.

*Muscles.**

Corrugator supercilii.

Levator menti.

Arteries.

Frontal (ophthalmic).

Supra-orbital.

Facial.

- Inferior labial.
- Superior coronary.
- Inferior coronary.
- Angular.

Infra-orbital (int. maxillary).

Mental.

Vein.

Facial.

* The attachments of all those muscles named opposite Plate I. may be indicated.

Plate 91.

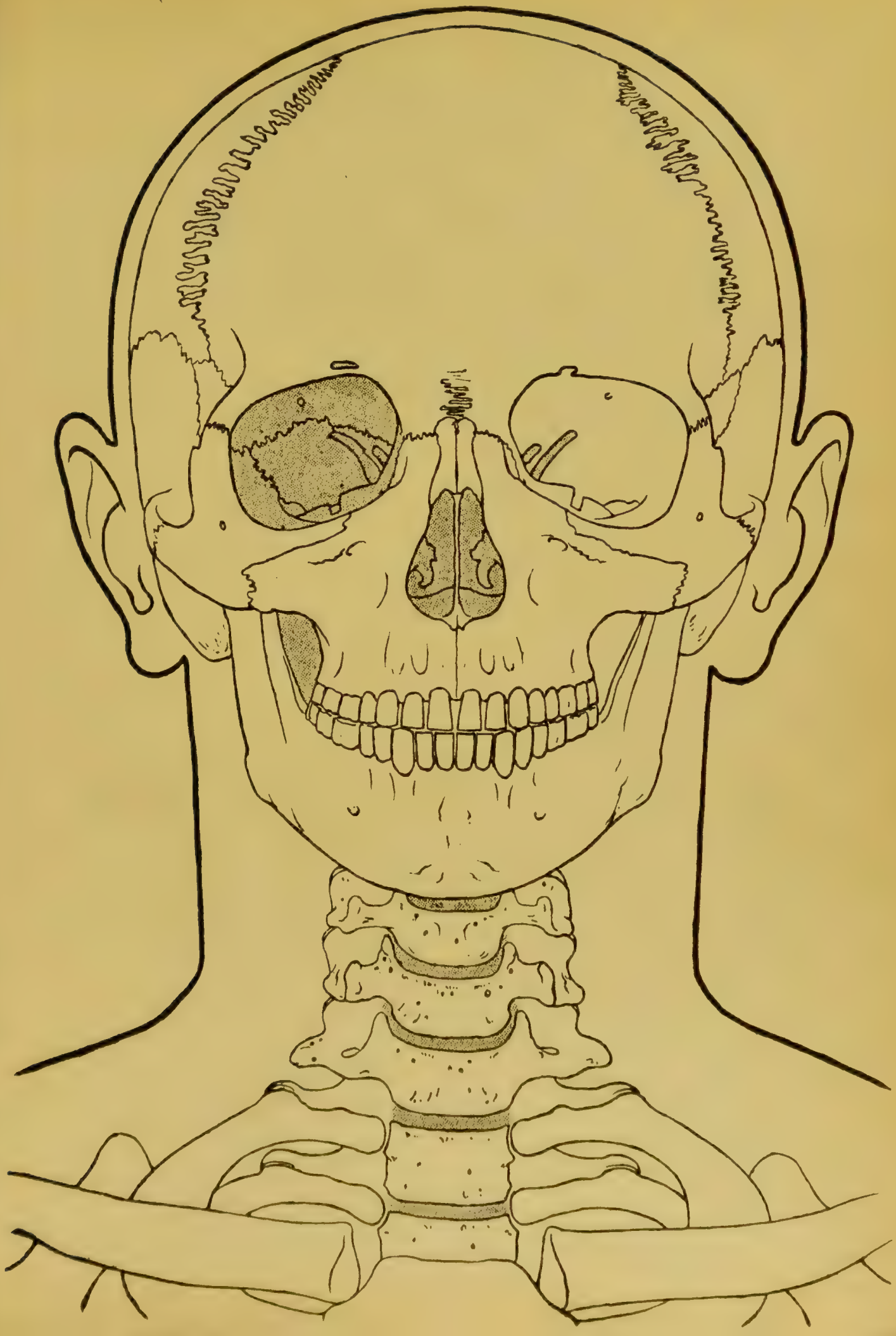
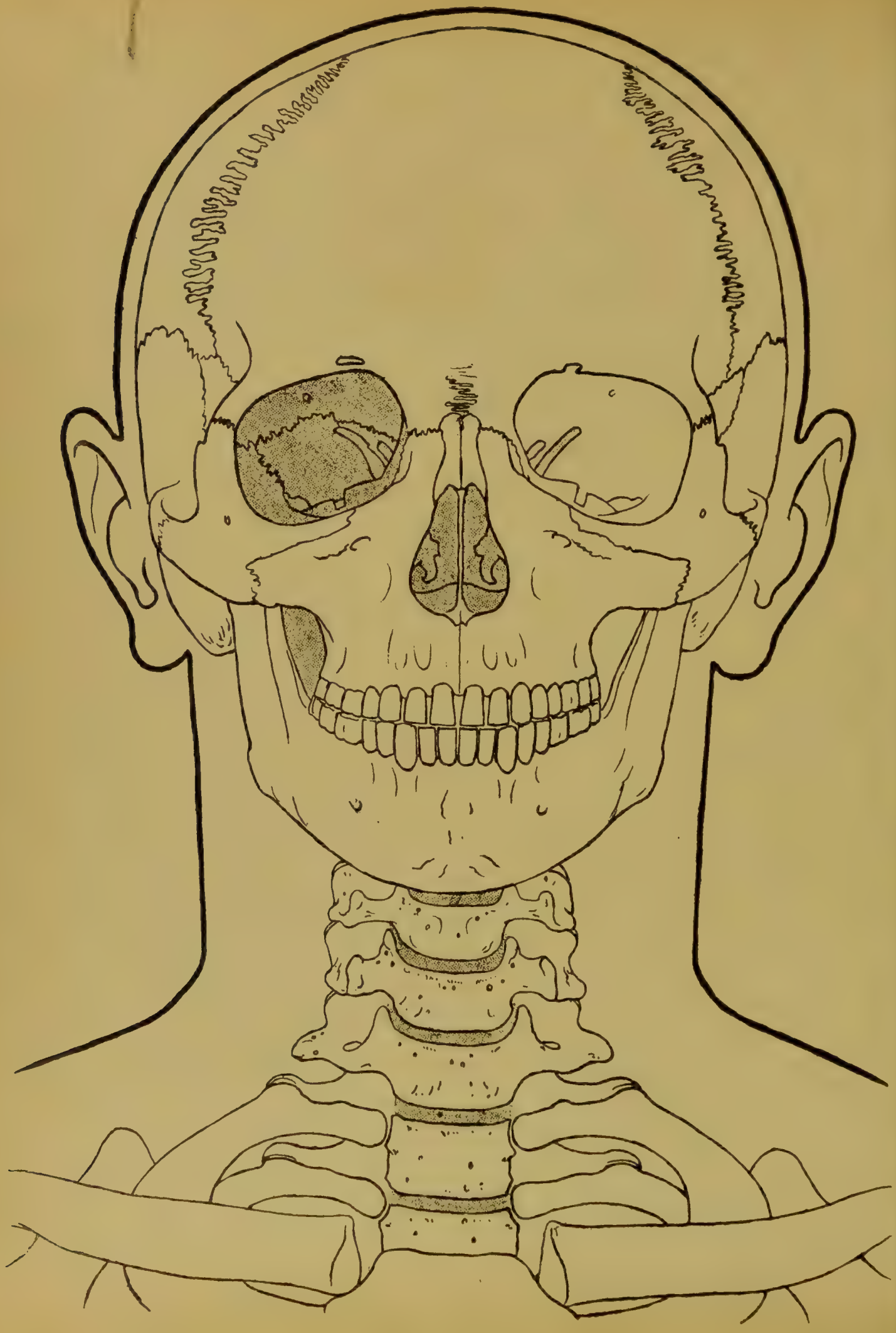


Plate 92.





FRONT VIEW OF HEAD AND NECK.

RIGHT OR LEFT.

Nerves.

Supra-orbital.
Supra-trochlear.
Infra-trochlear.
Nasal.
Infra-orbital.
- Palpebral.
- Nasal.
- Labial.

Mental.

SIDE VIEW OF HEAD AND NECK.

RIGHT OR LEFT.

Muscles.

Occipito-frontalis.
Attrahens aurem.
Attollens aurem.
Retrahens aurem.
Sterno mastoid.
Trapezius.
Splenius capitis.
Levator anguli scapulæ.
Scalenus medius.
Scalenus posticus.
Serratus magnus (first serration).
Omo-hyoid (posterior belly).

Arteries.

Vertebral (subclavian).
Occipital (ext. carotid).
Transversalis colli (thyroid axis).
Transversalis humeri (thyroid axis).
Subclavian (third portion).

Nerves.

Great occipital.
Small occipital.
Great auricular.
Superficial cervical.
Descending cervical.
Sternal.
Clavicular.
Acromial.
Spinal accessory.

Plate 93.

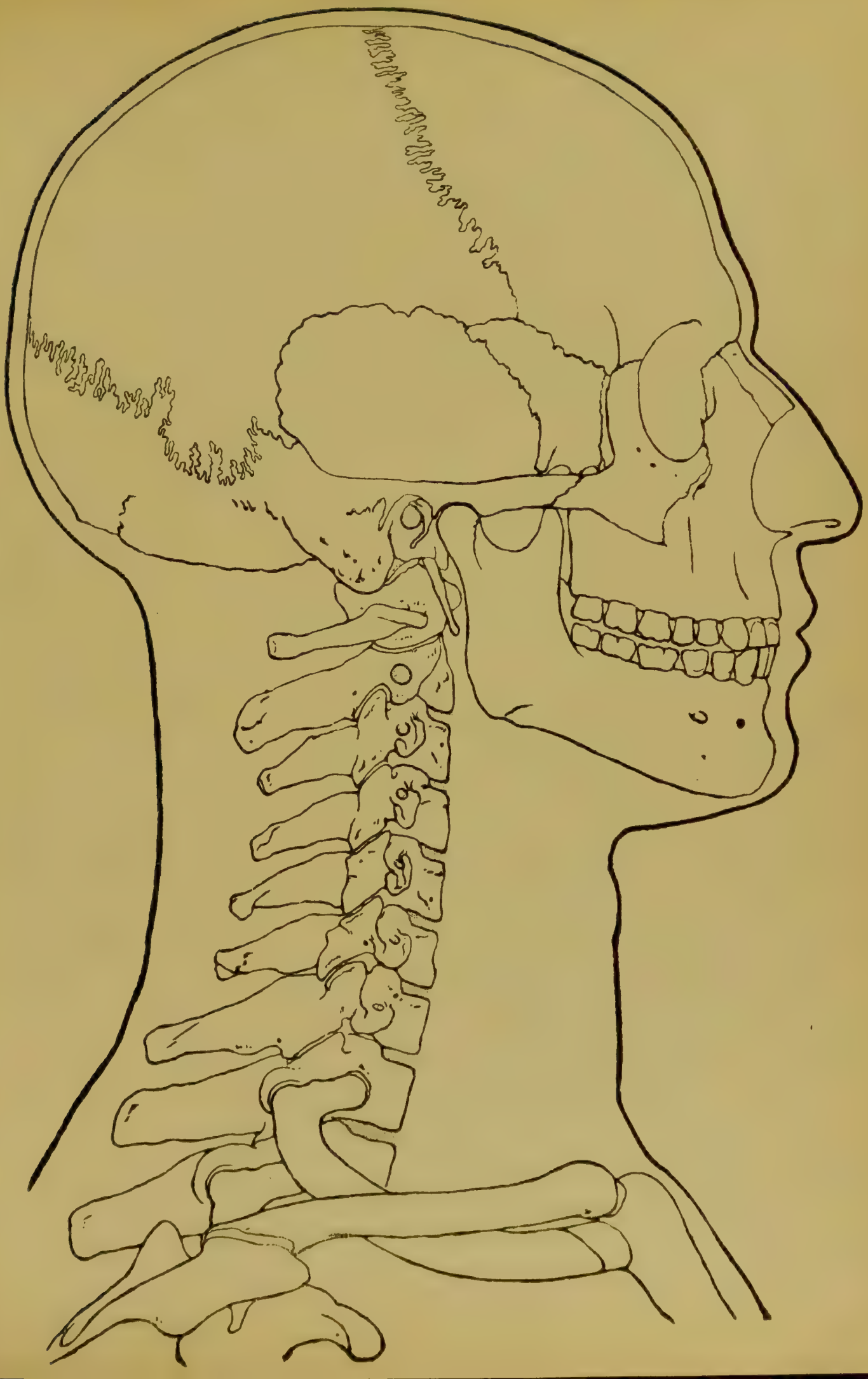


Plate 94.

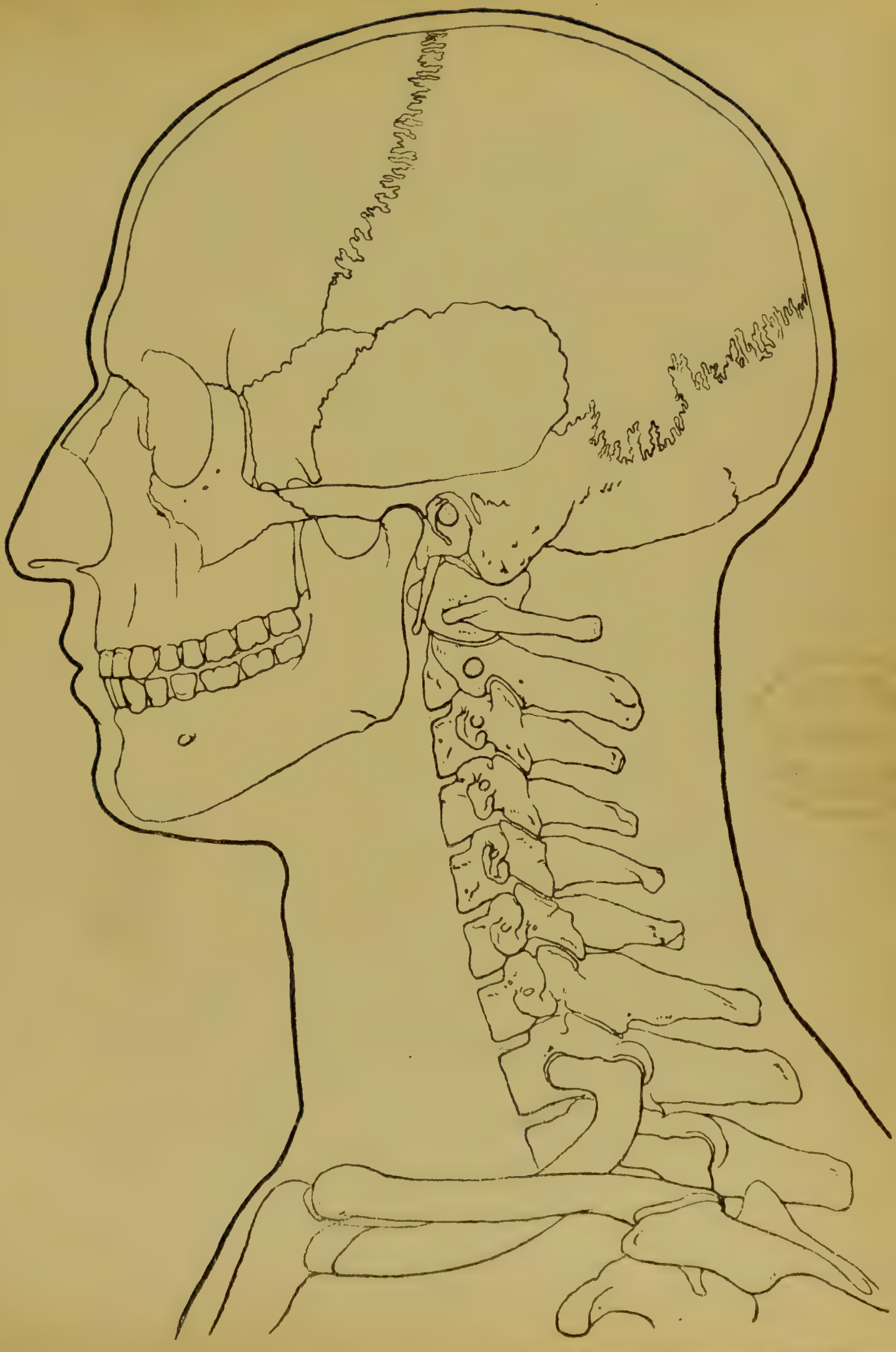


Plate 95.



SIDE VIEW OF HEAD AND NECK.

RIGHT OR LEFT.

Muscles.

Occipito-frontalis.
Temporal.
Masseter.
Buccinator.
Compressor naris.
Sterno-mastoid.
Platysma.*
Levator anguli oris.
Mylo-hyoid.
Stylo-hyoid.
Digastric.
Hyo-glossus.
Omo-hyoid.
Thyro-hyoid.
Sterno-hyoid.
Sterno-thyroid.
Sterno-mastoid.

Arteries.

External carotid.
- Thyroid.
- Lingual.
- Facial.
- Occipital.
- Temporal.

Gland.

Submaxillary.
Parotid.

Nerves.

Facial.
- Temporal.
- Malar.
- Infra-orbital.
- Buccal.
- Supra-maxillary.
- Infra-maxillary.

Plate 96.

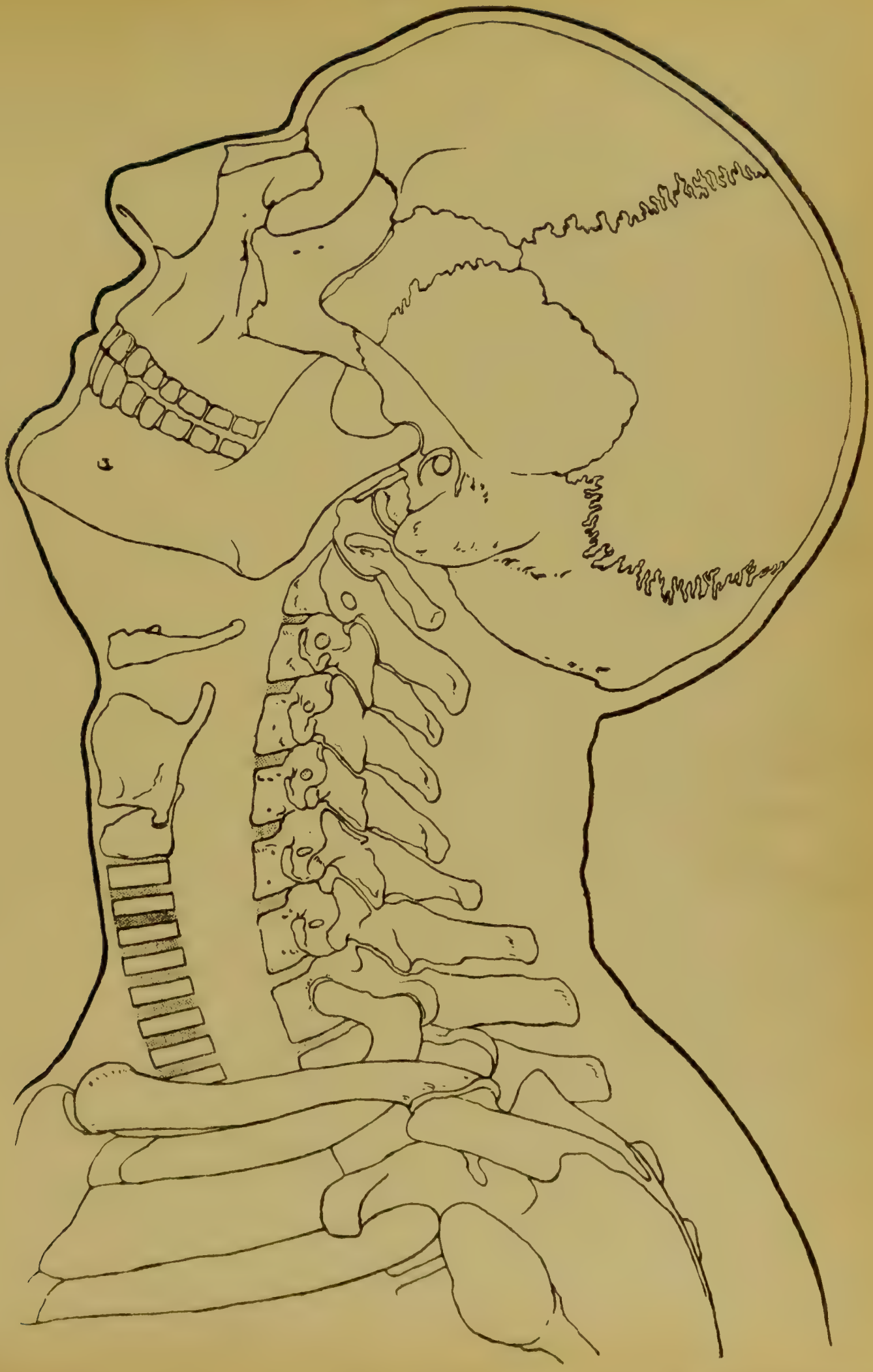


Plate 97.



SIDE VIEW OF HEAD AND NECK.

RIGHT OR LEFT.

Muscles.

Thyro-hyoid.
Middle constrictor.
Inferior constrictor.
Upper part of œsophagus.
Scaleni.
Levator anguli scapulæ.
Omo-hyoid.
Longus colli.
Crico-thyroid.

Arteries.

Subclavian.
- Thyroid axis.
  - Inferior thyroid.
  - Transverse cervical.
  - Supra-scapular.

Subclavian—*continued.*
- Vertebral.
  - Superior intercostal.
    - Profunda cervicis.

Occipital (external carotid).
- Princeps cervicis.

Trunk of carotid.

Nerves.

Hypoglossal.
- Descendens noni.
- Thyro-hyoid.

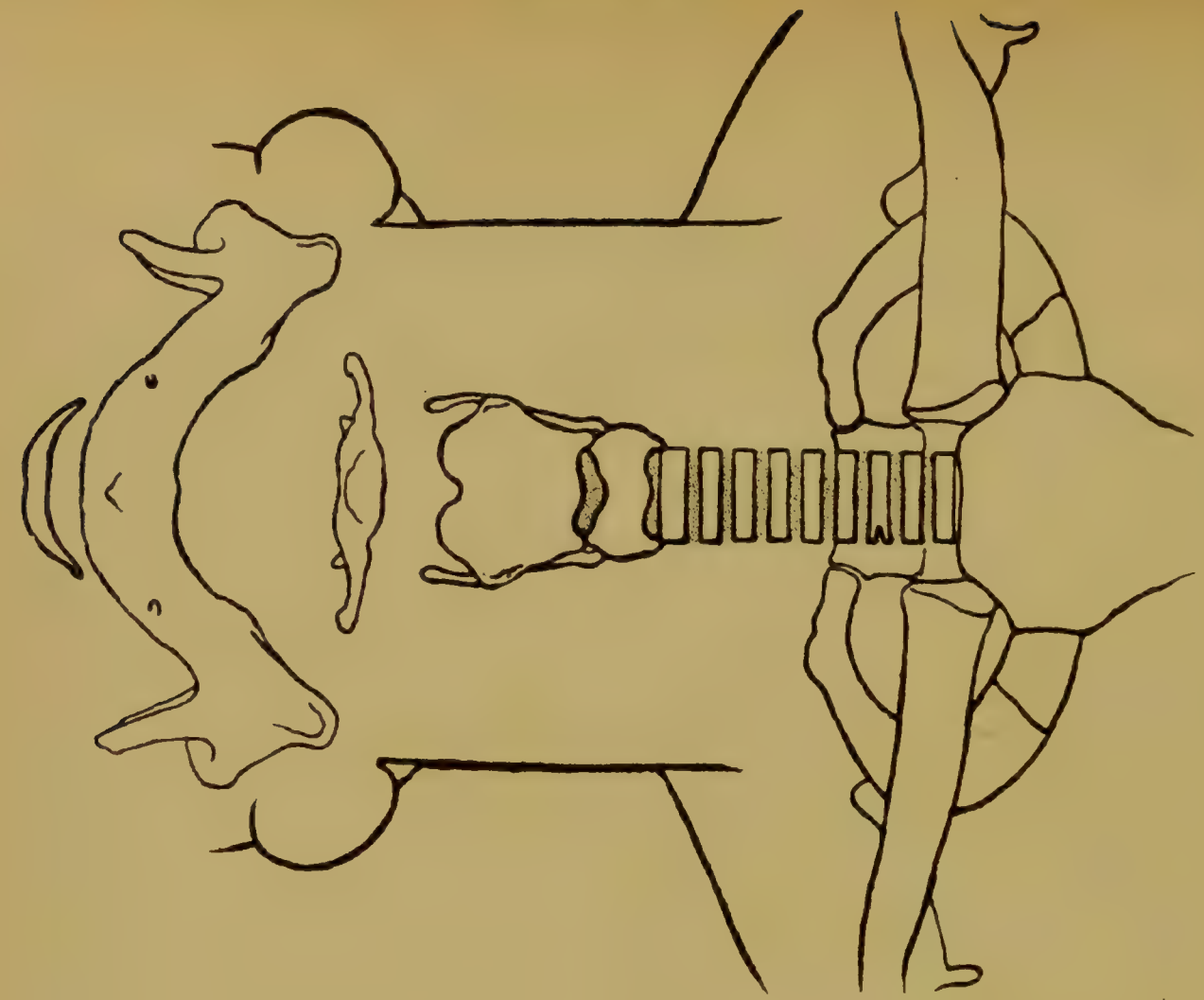
Phrenic (4–5 cervical).

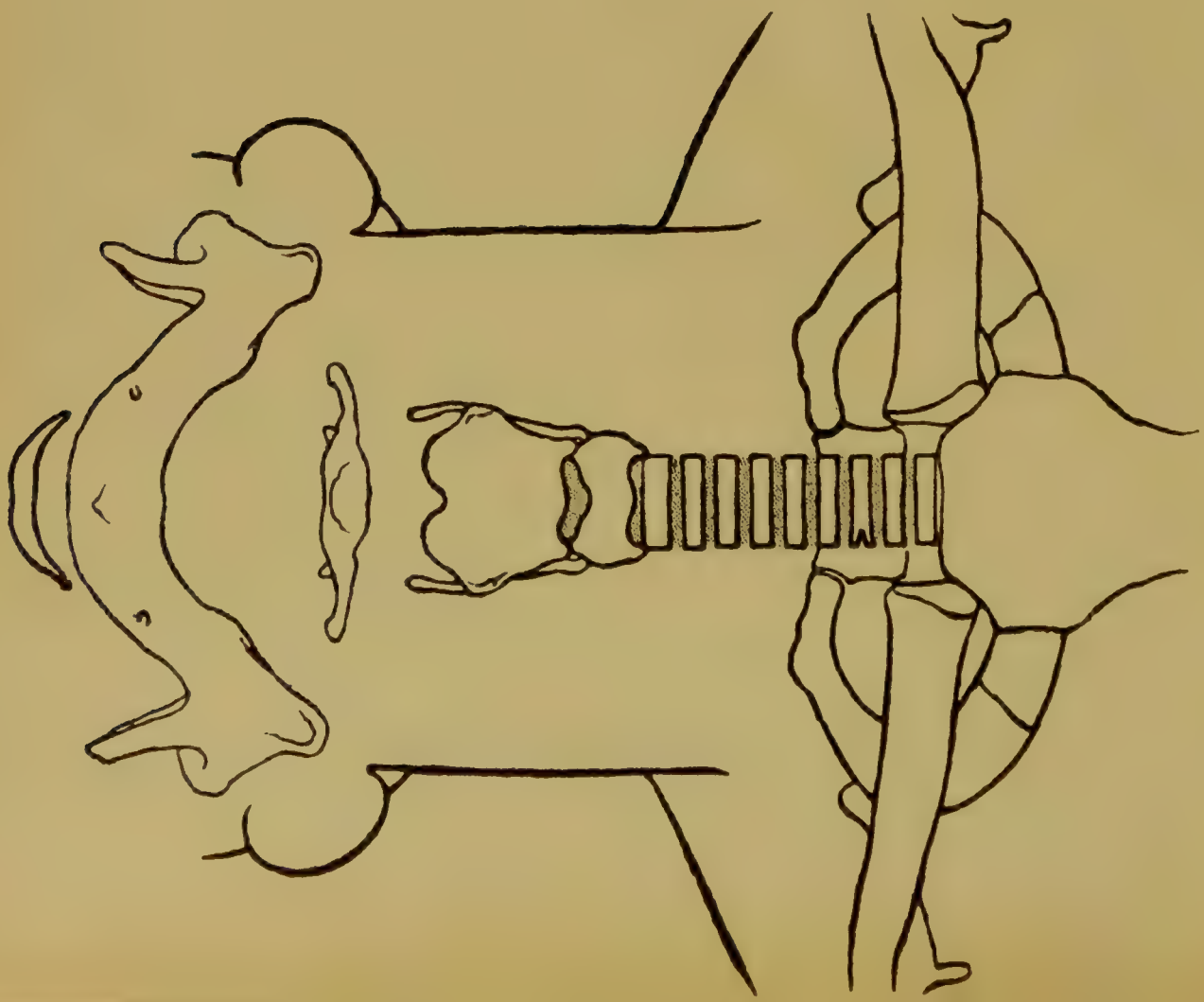
Pneumogastric (eighth).
- Superior laryngeal.
  - External laryngeal.
- Recurrent laryngeal.

Plate 98.



Plate 99.





FRONT VIEW OF NECK.

Right Side.

I.

Muscles.

Mylo-hyoid.
Thyro-hyoid.
Crico-thyroid.
Sterno-mastoid.*

Arteries.

Common carotid.
Subclavian.
- Thyroid axis.
  - Inferior thyroid.
  - Transverse cervical.
  - Supra-scapular.
- Internal mammary.

Nerve.

Pneumogastric.

Gland.

Thyroid.

Left Side.

I.

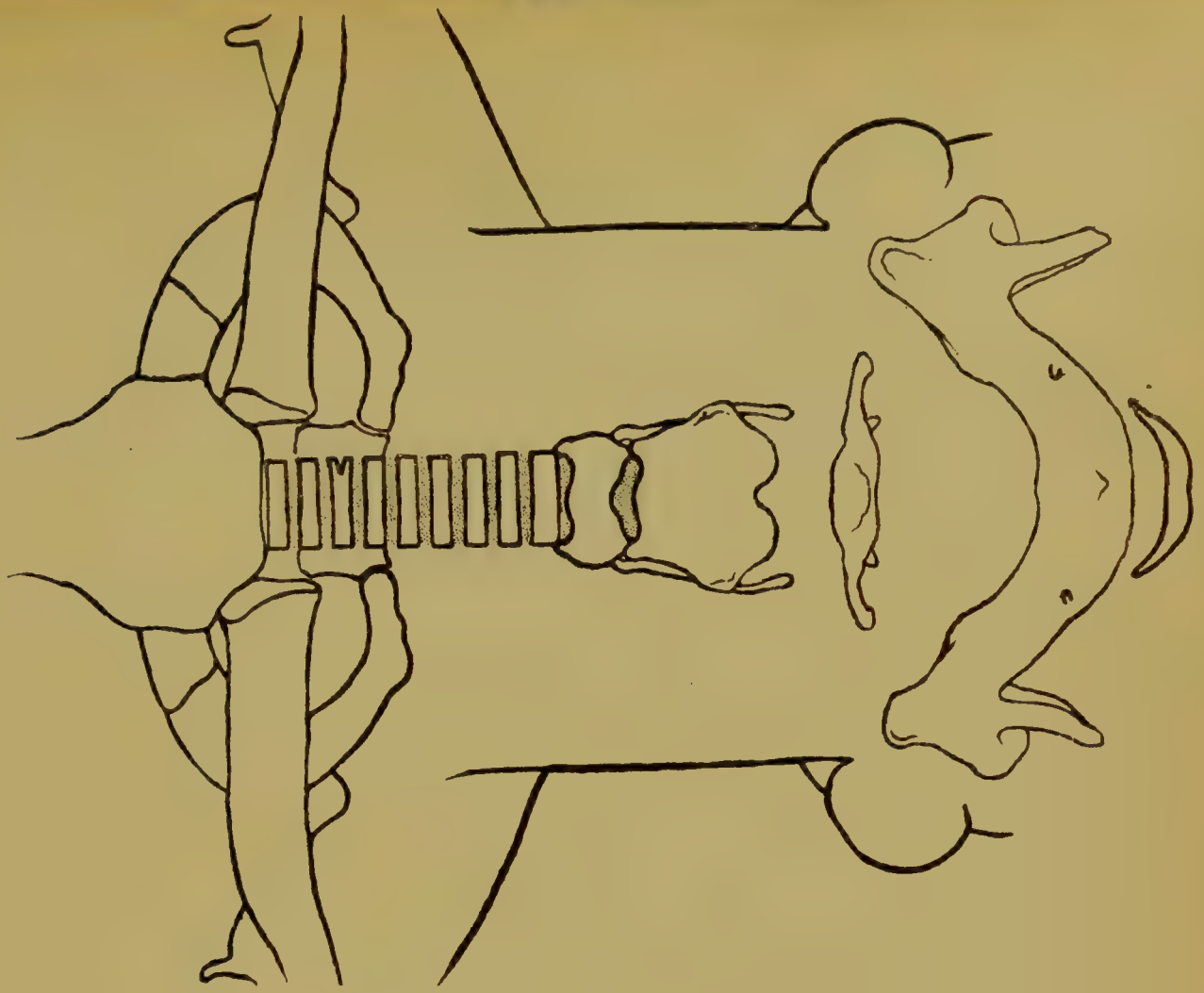
Muscles.

Digastric (anterior belly).
Mylo-hyoid.
Sterno-hyoid.
Omo-hyoid.

FRONT VIEW OF NECK—continued.

Right Side.	Left Side.
II.	II.
Muscles.	*Muscles.*
Hyo-glossus.	Mylo-hyoid.
Genio-hyoid.	
Sterno-thyroid.	*Veins.*
	Anterior jugular.
	Internal jugular.
	Subclavian.
	Ligaments.
	Thyro-hyoid membrane.
	Crico-thyroid membrane.

Plate 100.



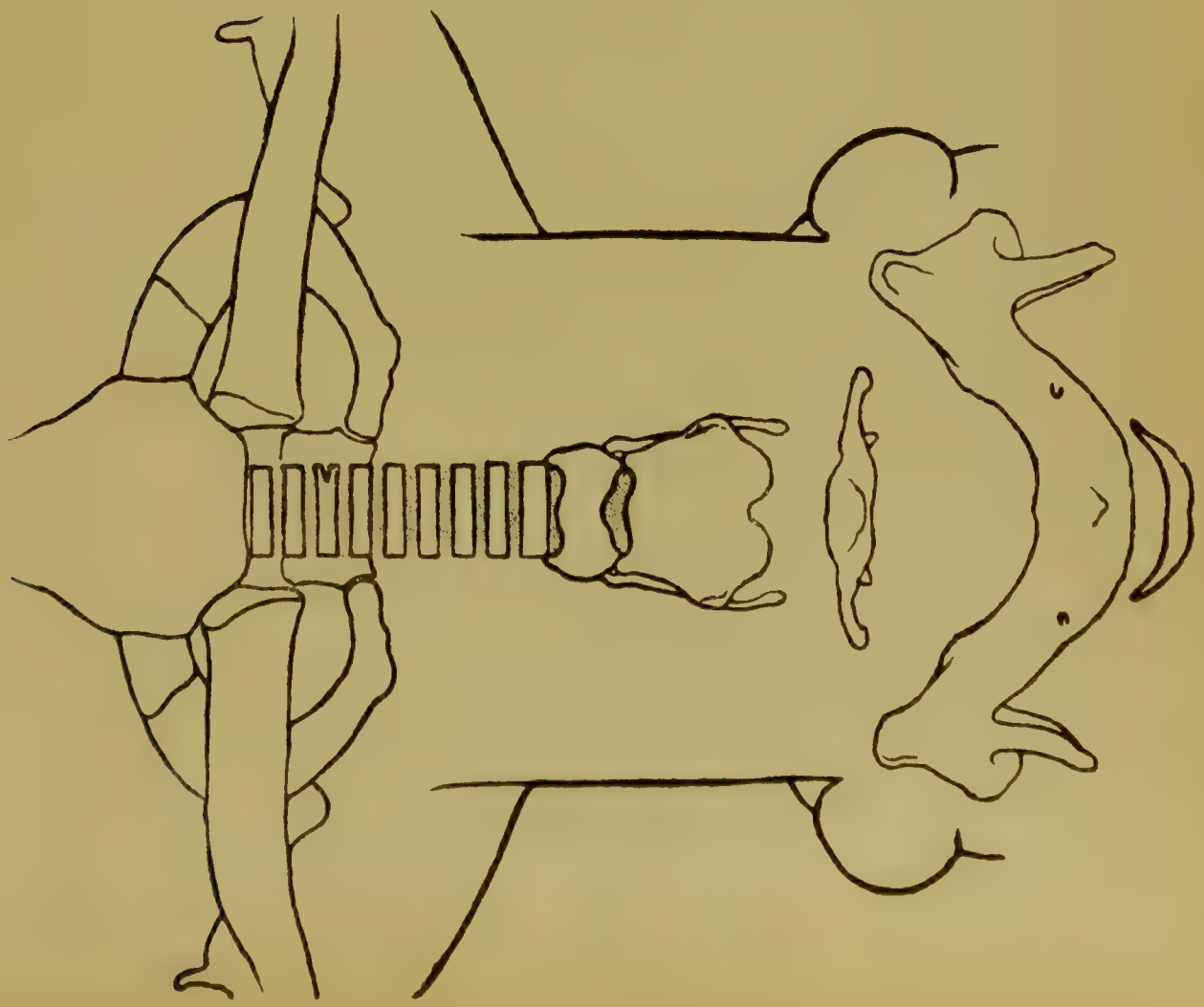




Plate 101.





TEMPORAL MASSETERIC AND SUBMAXILLARY REGIONS.

RIGHT OR LEFT.

Muscles.

Temporal.
Buccinator.
Masseter.*
Digastric.
Stylo-hyoid.
Mylo-hyoid.
Hyo-glossus.

Arteries.

External carotid.
- Thyroid.
- Lingual.
- Facial.
- Occipital.
- Posterior auricular.
- Temporal.
- Internal maxillary.

Ligament.

External lateral of lower jaw.

TEMPORAL MASSETERIC AND SUBMAXILLARY REGIONS.

RIGHT OR LEFT.

Muscles.

Temporal.*
Masseter.
External pterygoid.
Buccinator.*
Mylo-hyoid.
Hyo-glossus.
Thyro-hyoid.

Arteries.

External carotid.
  Temporal.
    Transverse facial.
    Middle temporal.
    Anterior auricular.
    Anterior temporal.
    Posterior temporal.

Nerves.

Auriculo temporal (5th).
Facial (pes anserinus) (7th).
Hypoglossal (9th).
  Descendens noni.
  Thyro-hyoid.

Gland.

Socia parotidis.
Steno's duct.

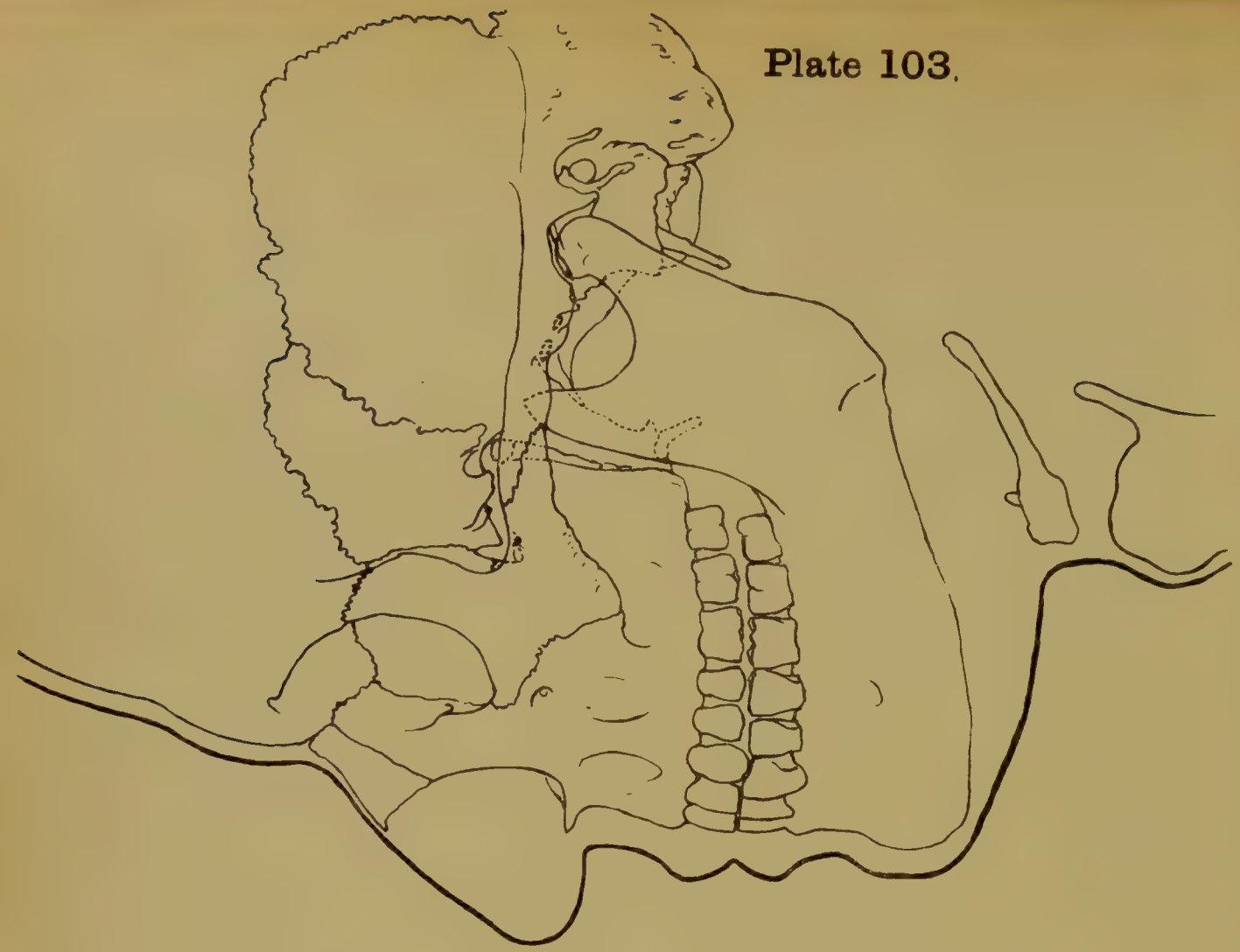
Ligament.

Stylo-hyoid.

Plate 102.



Plate 103.





TEMPORAL MASSETERIC AND SUBMAXILLARY REGIONS.

RIGHT OR LEFT.

Muscles.

Internal pterygoid.
Hyo-glossus.
Mylo-hyoid.
Digastric.

Arteries.

Internal maxillary.
- Tympanic.
- Middle meningeal.
- Small meningeal.
- Inferior dental.
- Buccal.
- Deep temporal.
- Spheno-palatine.
- Infra-orbital.
- Alveolar.

Nerves.

Inferior maxillary.
Auriculo-temporal.
Inferior dental.
Gustatory.
Masseteric.
Buccal.

Gland.

Submaxillary.

Ligament.

Stylo-maxillary.

DEEP VIEW OF MASSETERIC AND SUBMAXILLARY REGIONS.

RIGHT OR LEFT.

Muscles.

Internal pterygoid.
Mylo-hyoid.
Genio-hyoid.

Arteries.

External carotid.
- Lingual.
  - Hyoid.
  - Dorsalis linguæ.
  - Sublingual.
  - Ranine.
- Occipital.

Nerves.

Gustatory (5th).
Inferior dental (5th).
- Mylo-hyoid.

Nasal (5th).
Naso-palatine (Meckel's).
Hypoglossal (9th).

Gland.

Sublingual.

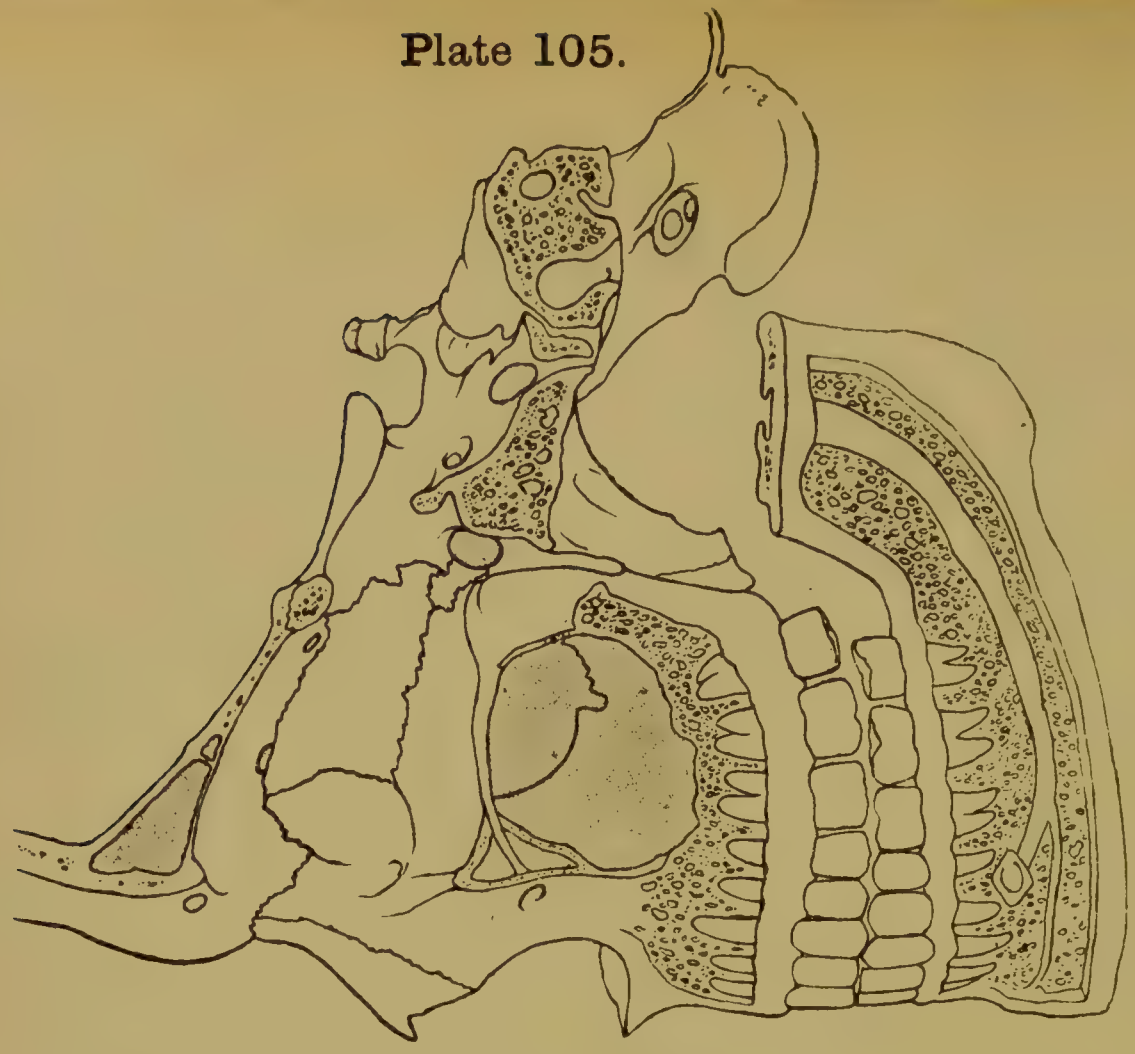
Ligaments.

Internal lateral of lower jaw.
Stylo-hyoid.
Stylo-maxillary.
Thyro-hyoid.

Plate 104.



Plate 105.





SECTION OF FACE FOR FIFTH NERVE.

RIGHT OR LEFT.

Ophthalmic.

- Lachrymal.
- Frontal.
  - Supra-trochlear.
  - Supra-orbital.
- Nasal.
  - Ganglionic branch.
  - Long ciliary.
  - Infra-trochlear.
  - Lenticular ganglion.

Superior maxillary.

- Posterior dental.
- Anterior dental.
- Infra-orbital.
  - Palpebral.
  - Nasal.
  - Labial.
- Meckel's ganglion.

Inferior maxillary.

- Auriculo-temporal.
- Lingual.
- Inferior dental.
  - Dental.
  - Incisor.
  - Labial.



SIDE VIEW OF TONGUE.

RIGHT OR LEFT.

Muscles.

Stylo-glossus.
Stylo-pharyngeus.
Hyo-glossus.
Genio-hyo-glossus.
Thyro-hyoid.
Crico-thyroid.
Sterno-thyroid.*
Inferior constrictor of pharynx.

Arteries.

Lingual.

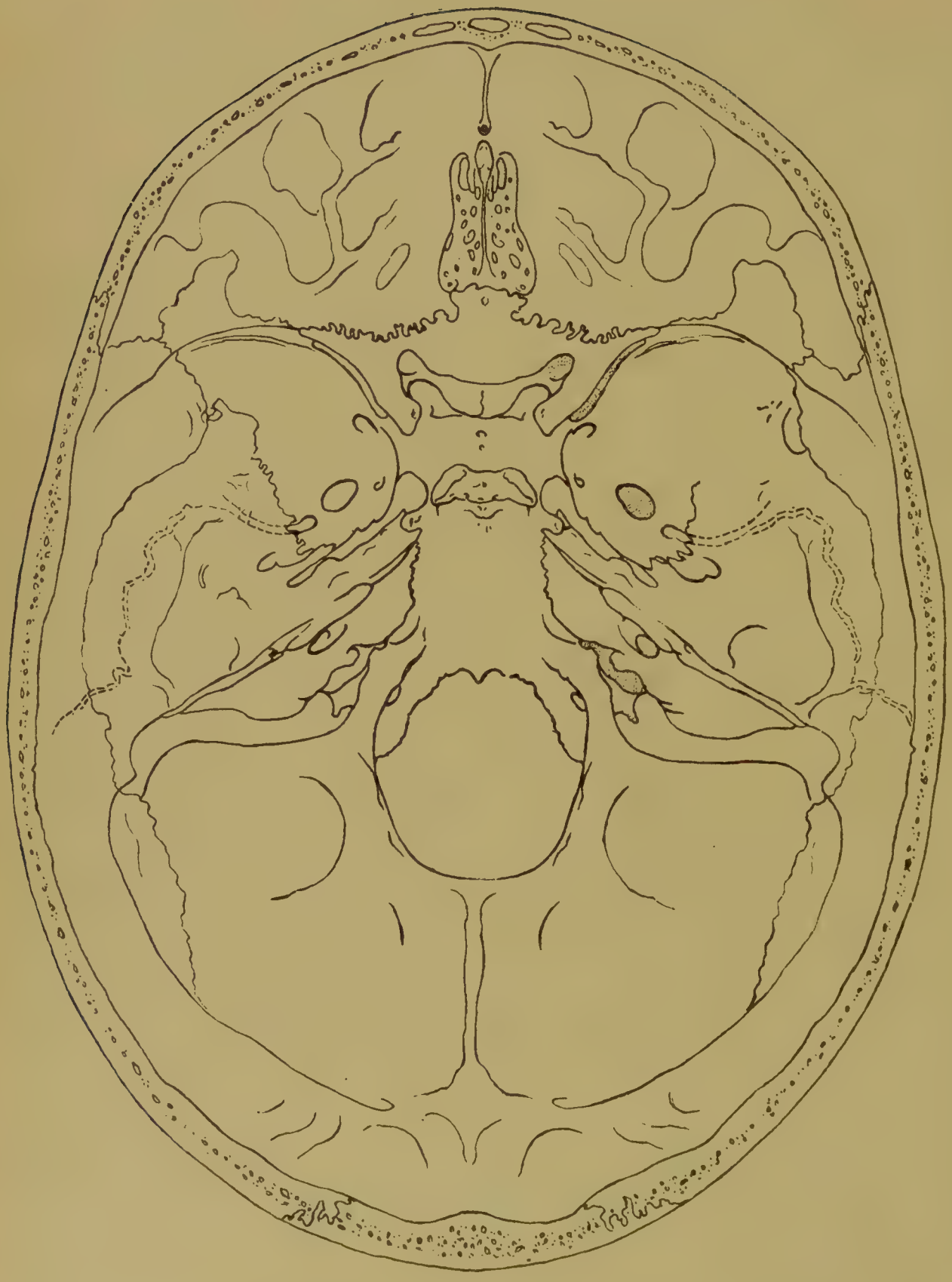
Nerves.

Gustatory (5th).
Submaxillary ganglion.
Hypoglossal (9th).
Thyro-hyoid.
Superior laryngeal (8th).
External laryngeal.

Plate 106.



Plate 107.



BASE OF SKULL.

Arteries.

Vertebrals.
Basilar.
Carotids.
Anterior meningeal (ethmoidal and int. carotid).
Middle meningeal, Small meningeal } internal maxillary.
Meningeal branch of ascending pharyngeal.
Meningeal branch of occipital.
Posterior meningeal (vertebral).

Veins.

Ophthalmic.
Cavernous sinus.
Circular sinus.
Transverse sinus.
Superior petrosal sinus.
Inferior petrosal sinus.
Lateral sinus.
Superior longitudinal sinus.
Occipital sinuses.

BASE OF SKULL.

Arteries.

Internal carotid.

Ophthalmic.

Nerves.

1st. Olfactory.

2nd. Optic.

3rd. Motor oculi.

4th. Pathetic.

5th. Trifacial.

6th. Abducens.

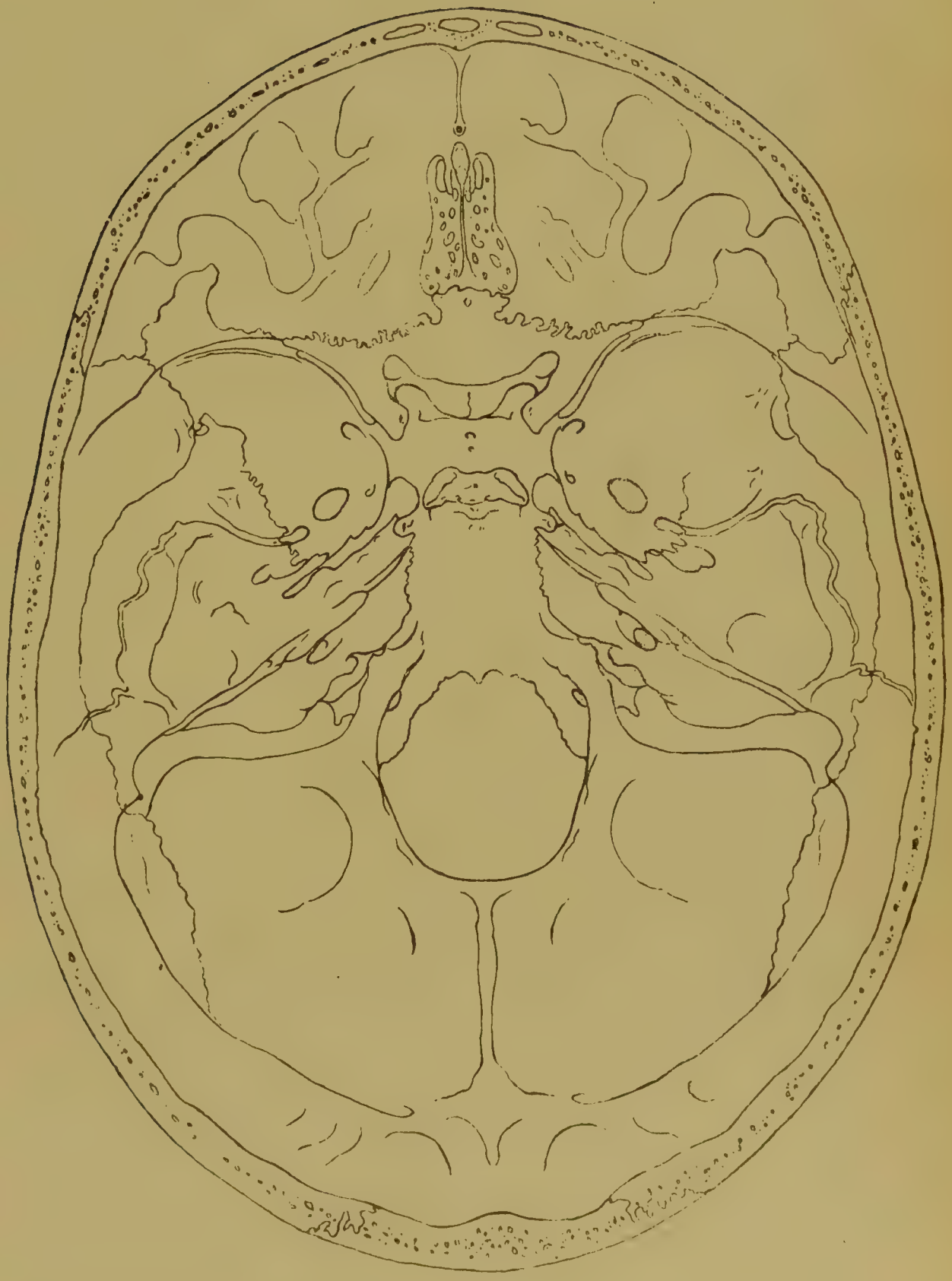
7th. Facial (portio dura).
Auditory (portio mollis).

8th. Glosso-pharyngeal.
Pneumogastric.
Spinal accessory.

9th. Hypoglossal (motor linguæ).

Nasal (cranial portion).

Plate 108.



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Plate 109.





VIEW OF ORBITS FROM ABOVE.

RIGHT.

I.

Muscles.

Levator palpebræ.
Superior oblique.
External rectus.

Arteries.

Ophthalmic.
Lachrymal.
Supra-orbital.
Frontal.
Nasal.

Nerves.

Pathetic (4th).
Frontal.
  Supra-orbital.
  Supra-trochlear.
Lachrymal.

Gland.

Lachrymal.

LEFT.

I.

Muscles.

Superior rectus.
Internal rectus.
External rectus.

Arteries.

Ethmoidal.

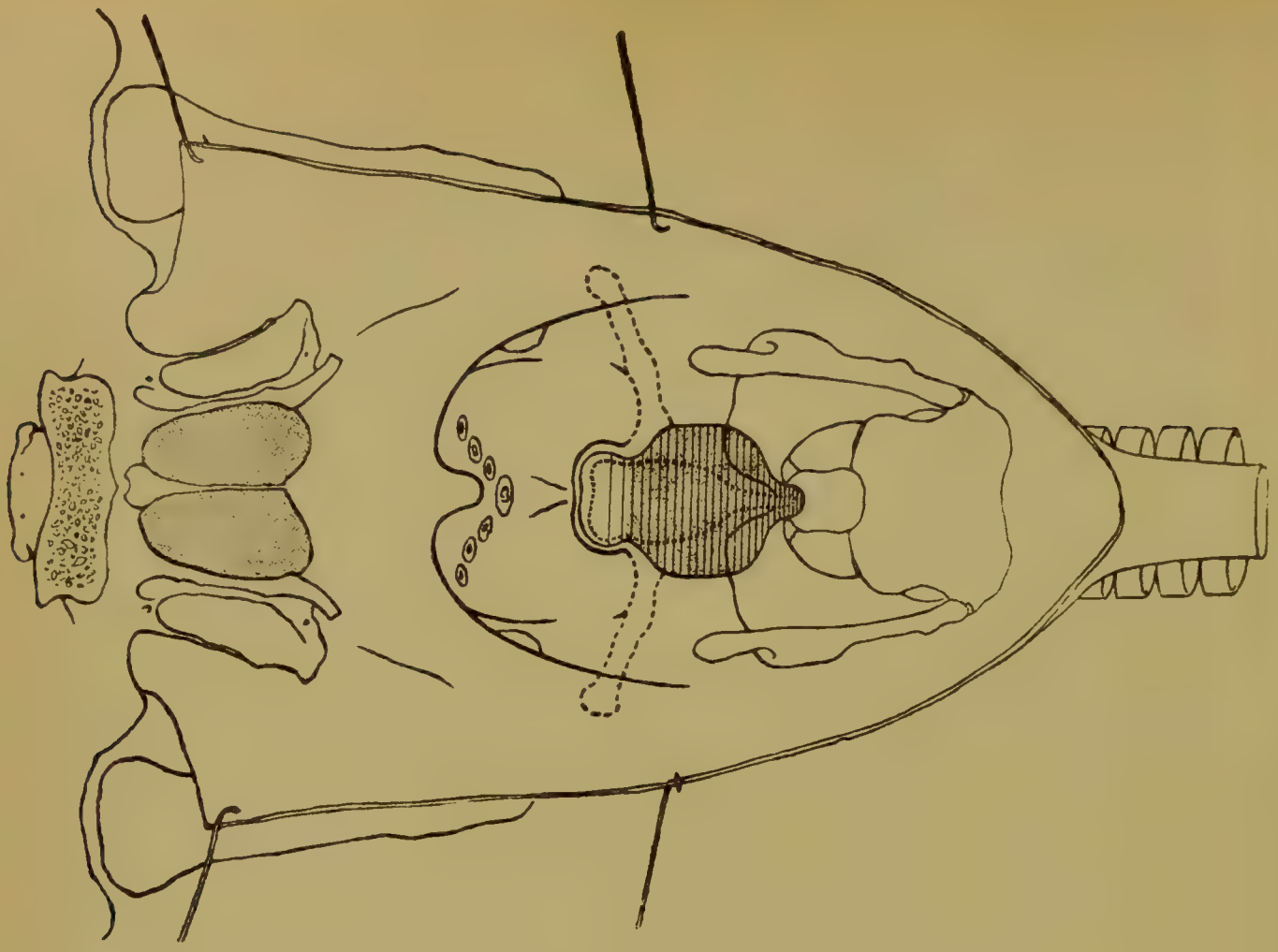
Nerves.

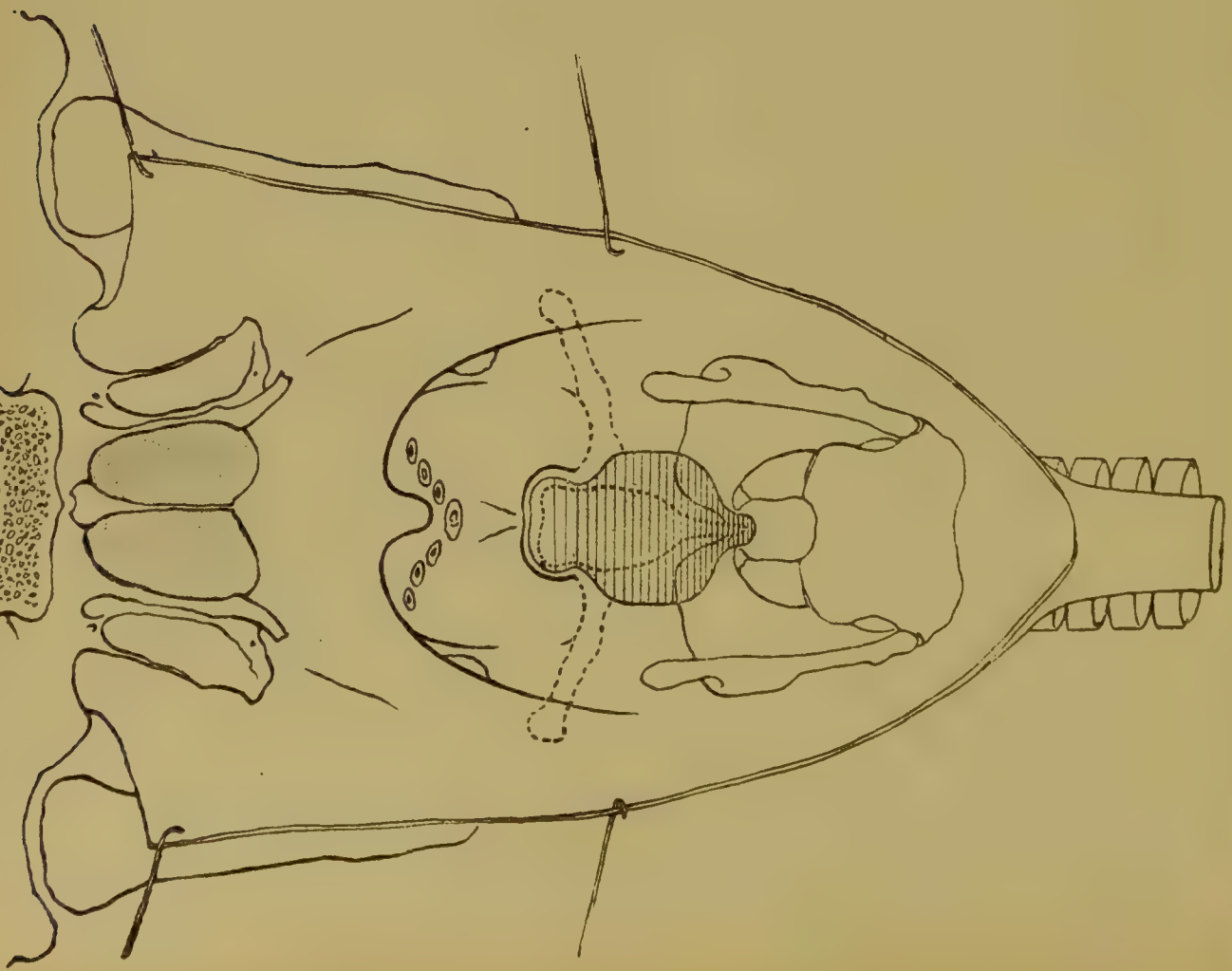
Nasal.
  Infra-trochlear.

VIEW OF ORBITS FROM ABOVE—continued.

RIGHT.	LEFT.
II.	II.
Muscles.	*Muscles.*
Inferior rectus.	Inferior oblique.
Inferior oblique.	External rectus.
Arteries.	*Nerves.*
Ciliary.	Motor oculi (3rd).
	Abducens (6th).
Nerves.	
Lenticular ganglion.	
Short ciliary.	
Long ciliary (nasal).	

Plate 110.





POSTERIOR VIEW OF PHARYNX AND SOFT PALATE.

RIGHT OR LEFT.

I.

Muscles.

Tensor palati.
Levator palati.
Azygos uvulæ.
Palato pharyngeus.
Palato-glossus.

Arteries.

Palate branch of ascending pharyngeal.

II.

Muscles.

Crico-arytenoideus posticus.
Arytenoideus.
Œsophagus (fibres attached to cricoid cartilage).

Nerves.

Superior laryngeal.
Recurrent laryngeal.

LARYNX AND HYOID BONE.

I.

Muscles.

Crico-thyroid.

Nerves.

Superior laryngeal.

External laryngeal.

Ligaments.

Crico-thyroid membrane.

Thyro-hyoid membrane.

II

Muscles.

Thyro-arytenoid.

Crico-arytenoid lateralis.

Ligaments.

Crico-thyroid membrane.

Crico-thyroid ligament.

True vocal cord.

Stylo-hyoid ligament.

III.

Muscles.

Crico thyroid.

Sterno-thyroid.

Thyro-hyoid.

Hyo-glossus.

IV.

Muscles.

Crico-arytenoideus posticus.

Arytenoideus.

Fibres of œsophagus.

Nerves.

Recurrent laryngeal.

Plate 111.

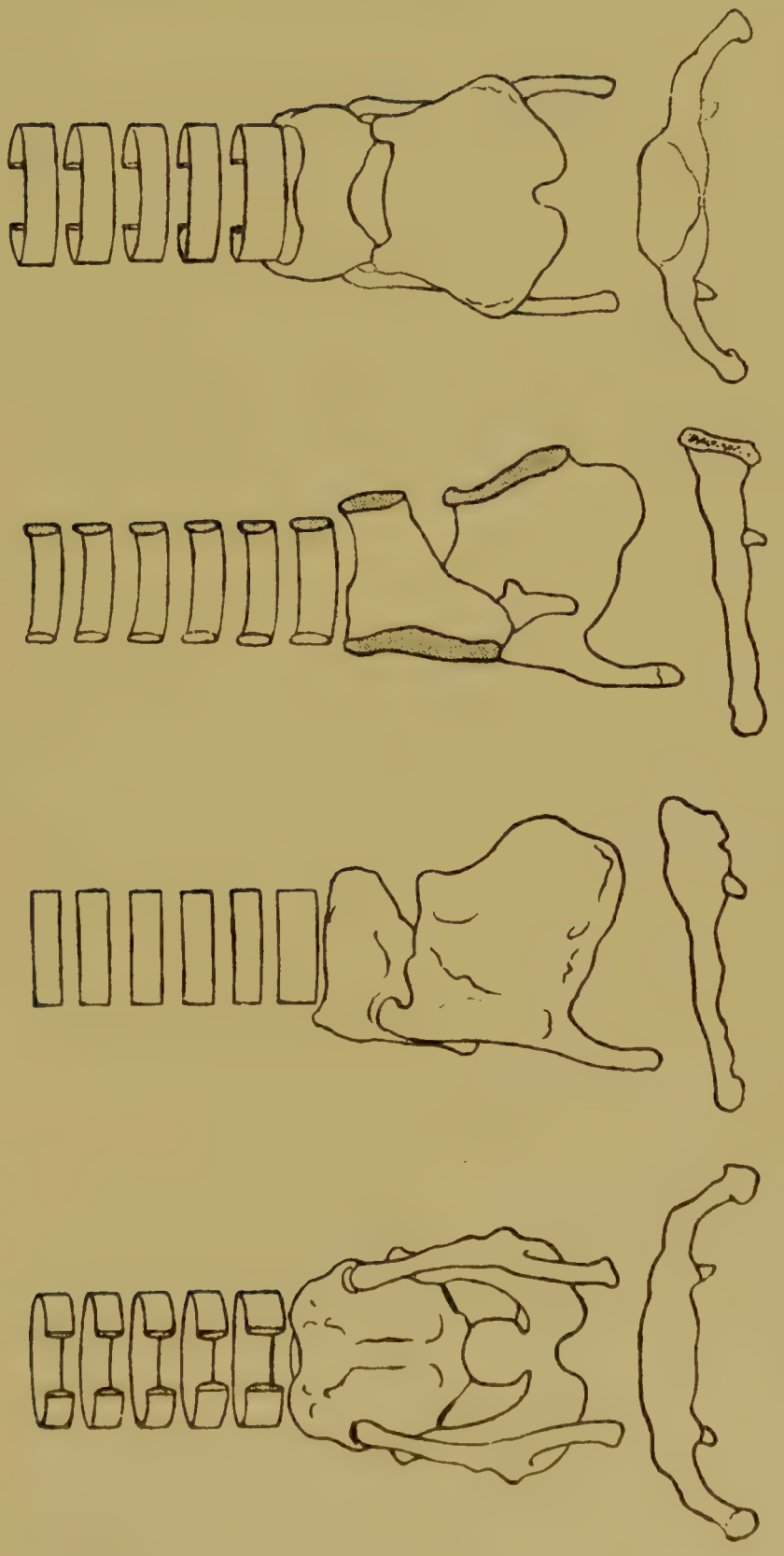
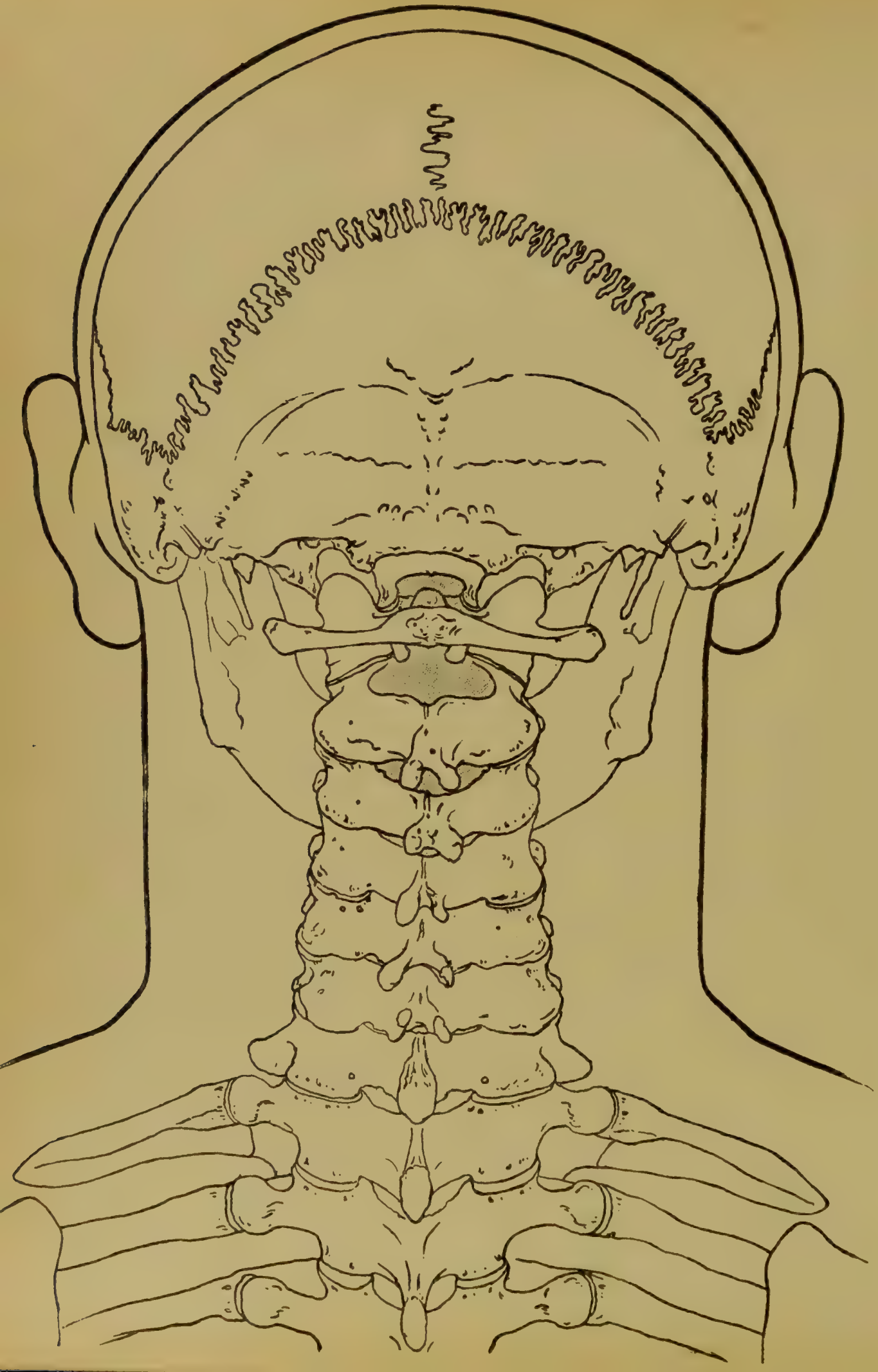


Plate 112.



BACK VIEW OF HEAD AND NECK.

RIGHT OR LEFT.

Muscles.

Occipito-frontalis (occipital portion).
Trapezius (cranial portion).
Sterno-mastoid.
Trachelo-mastoid.
Complexus.
Biventer cervicis.

Arteries.

Occipital.

Nerves.

Great occipital.
Posterior branches of cervical.

BACK VIEW OF HEAD AND NECK.

RIGHT OR LEFT.

Muscles.

Rectus capitis posticus major.
Rectus capitis posticus minor.
Superior oblique.
Inferior oblique.
Semispinalis colli.

Arteries.

Vertebral.
Occipital.
Princeps cervicis.
Profunda cervicis (superior intercostal).

Nerves.

Sub-occipital.
Great occipital.
Third occipital.

Plate 113.

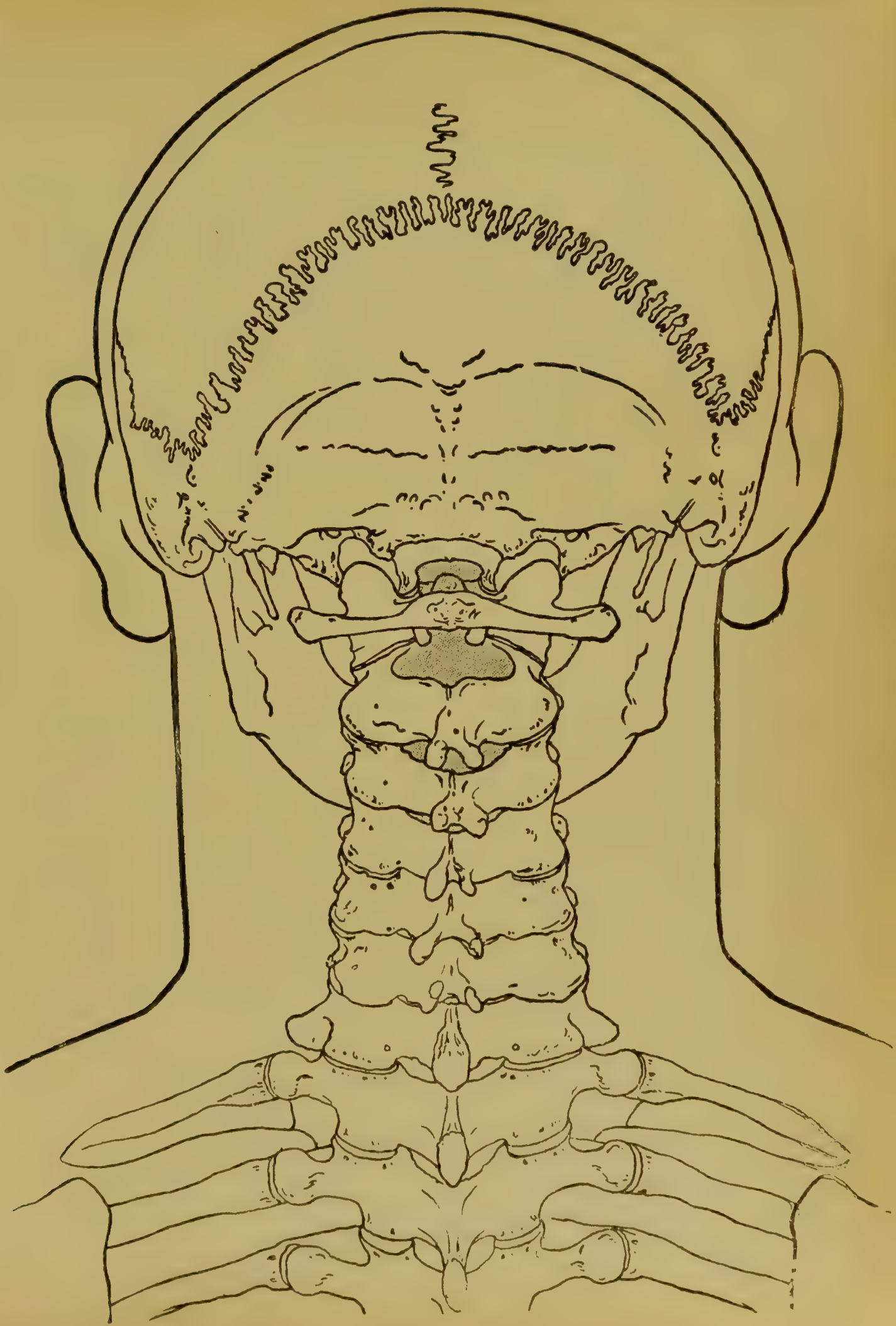
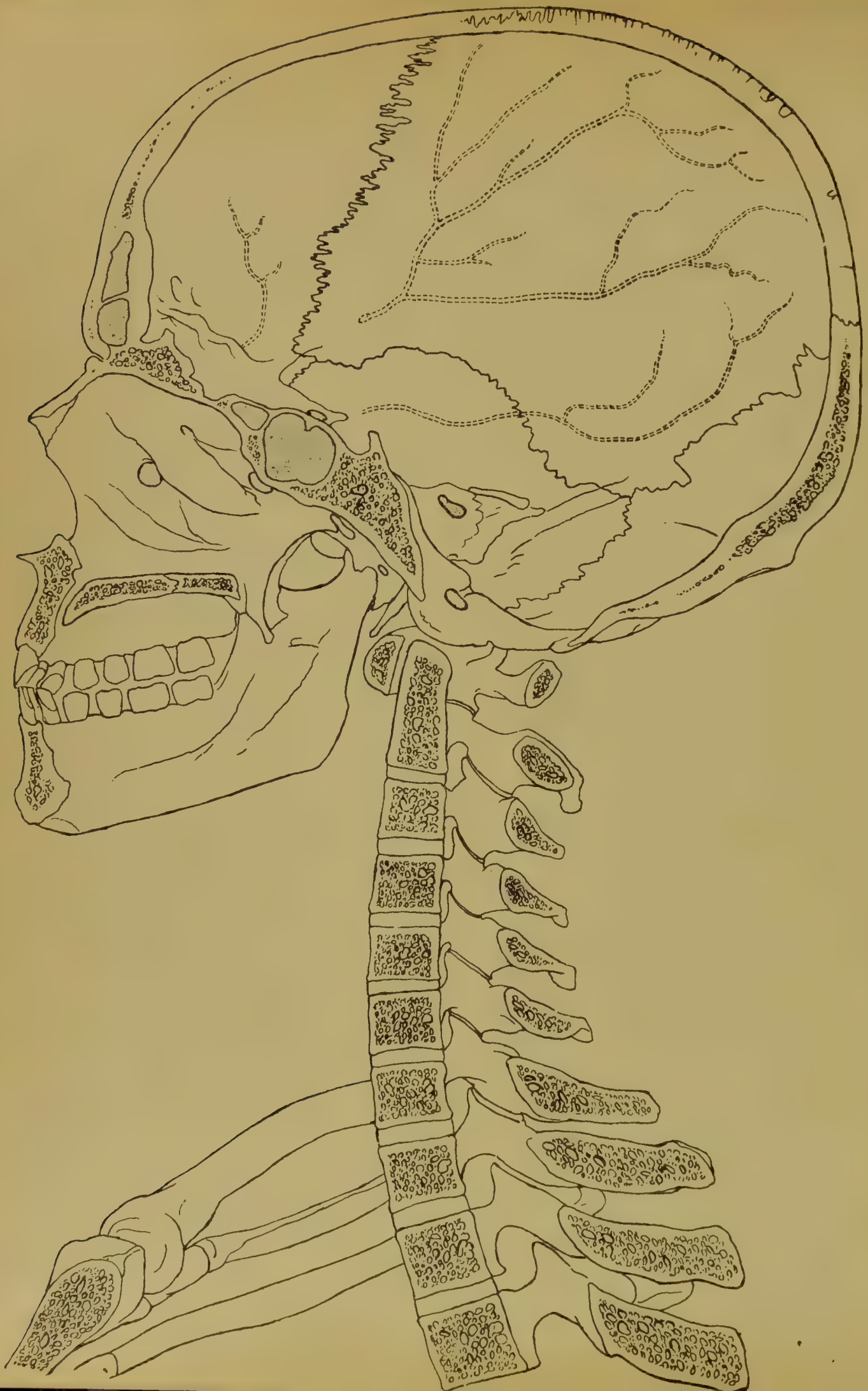




Plate 114.



VERTICAL SECTION OF SKULL AND CERVICAL VERTEBRÆ.

Muscles.

Interspinales.
Sterno-hyoid (origin).
Sterno-thyroid (origin).

Veins.

Torcular Herophili.
Straight sinus.
Veins of Galen.
Superior longitudinal sinus.
Inferior longitudinal sinus.

Ligaments, &c.

Falx cerebri.
Falx cerebelli.
Tentorium cerebelli.
Ligamentum nuchæ.
Supra-spinous.
Interspinous.
Subflava.
Anterior atlanto-occipital.
Posterior common.

Plate 115.

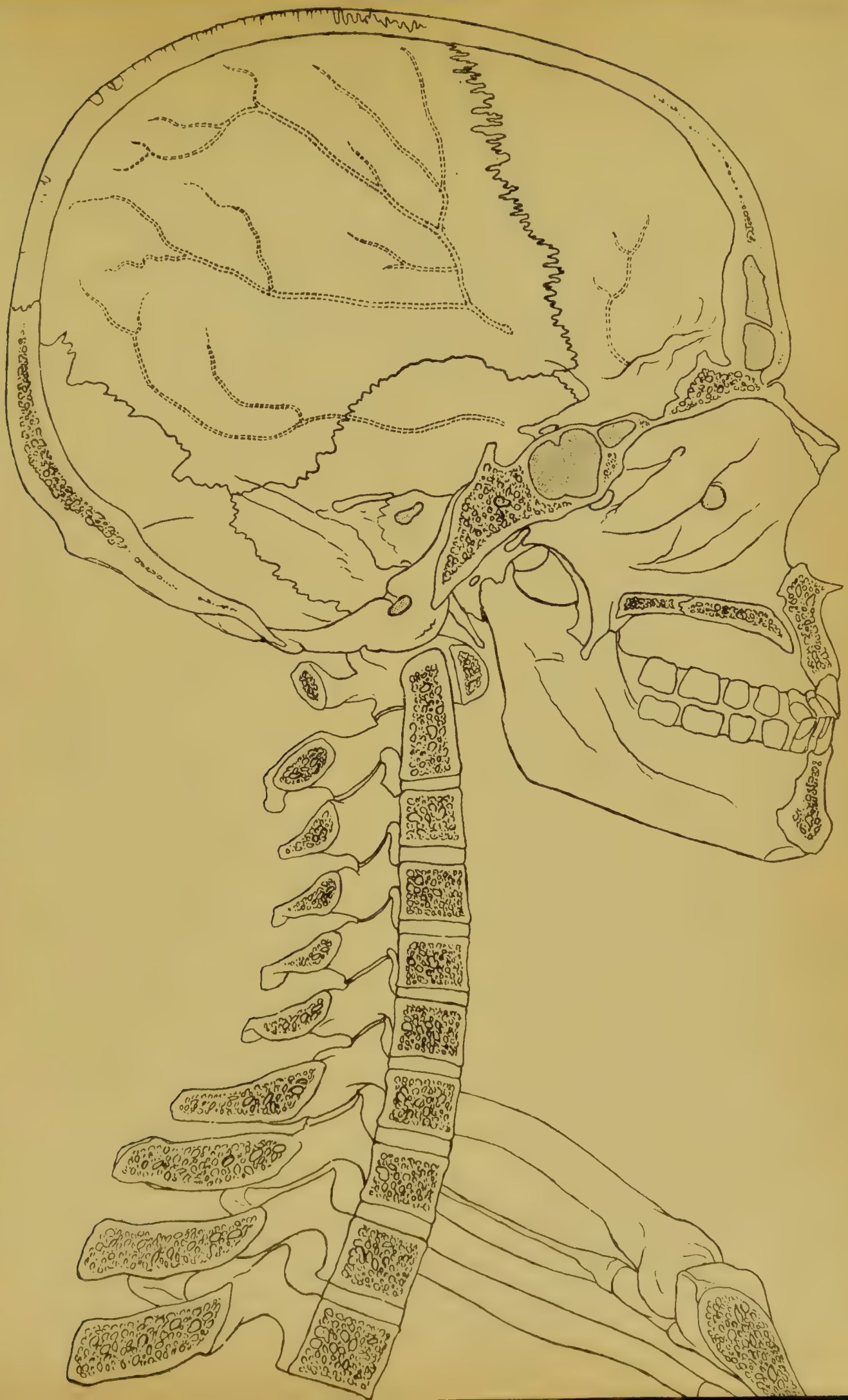
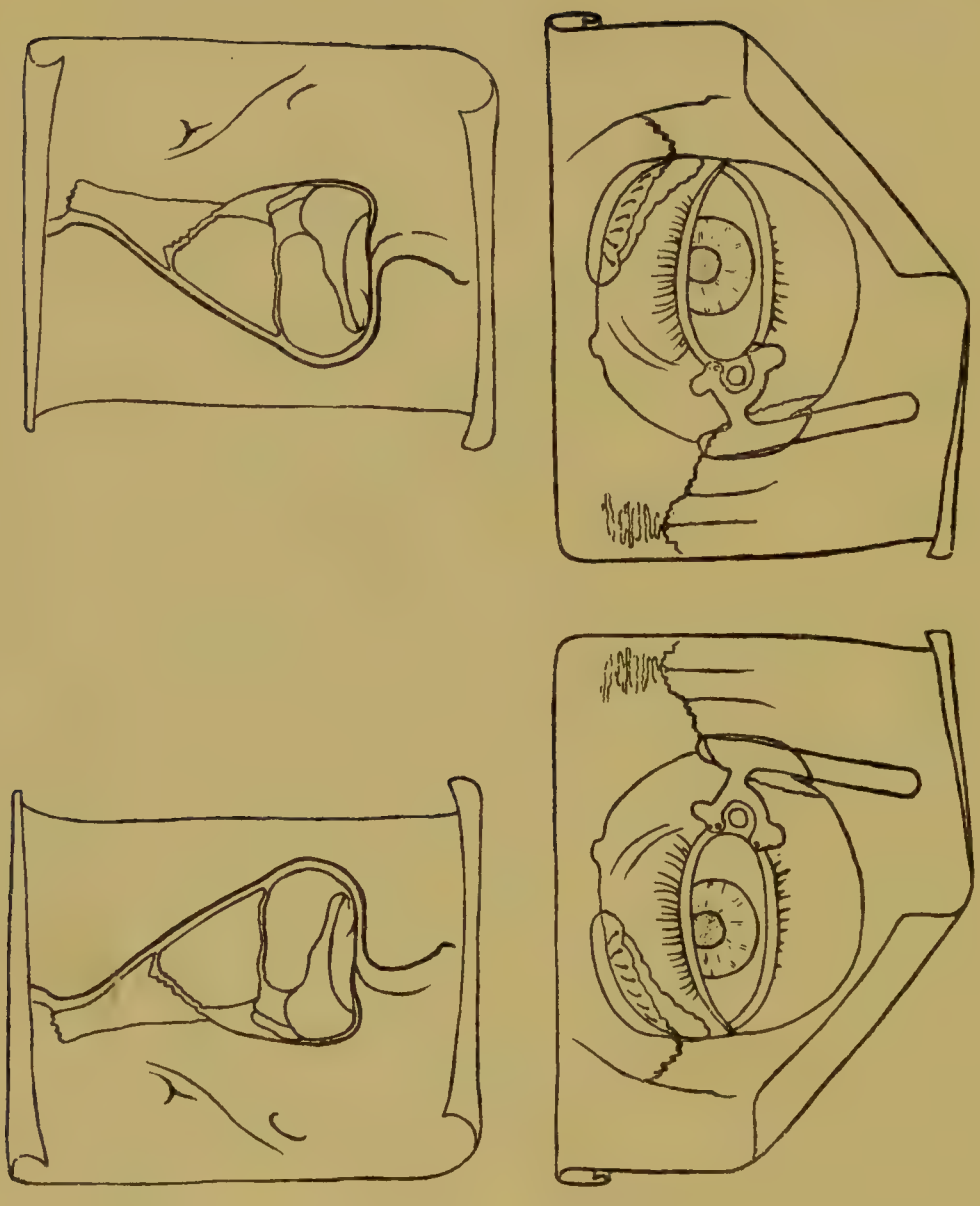


Plate 116.



SIDE VIEW OF NOSE AND LACHRYMAL APPARATUS.

RIGHT OR LEFT.

Muscles.

Pyramidalis nasi.
Compressor nasi.
Levator labii superioris alæque nasi.
Depressor alæ nasi.
Dilatator naris posterior.
Dilatator naris anterior.

Vessels.

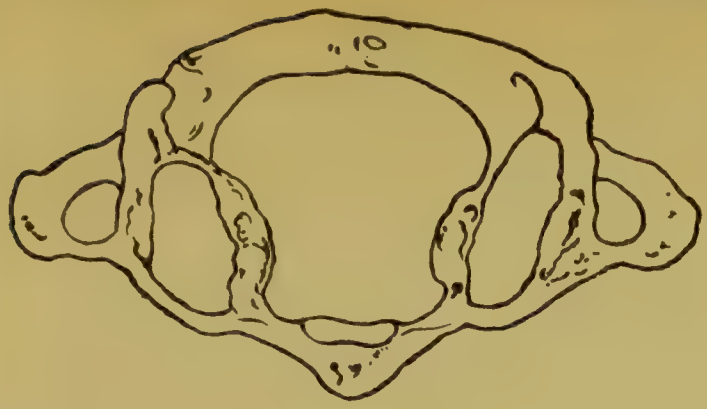
Angular (facial).
Lateralis nasi (facial).

Nerves.

Lachrymal (ophthalmic).
Nasal (ophthalmic).
Nasal branches of superior maxillary.

The following structures enter into the composition of the eyelids, and may be indicated in a diagrammatic form : Integument, subcutaneous areolar tissue, orbicularis (palpebral portion), tarsal cartilages, palpebral nasal ligaments and tendo-oculi with the tensor tarsi muscle, tendon of levator palpebræ superioris (upper lid), Meibomian glands, eye-lashes, conjunctiva. The lachrymal gland and its ducts, the plica semilunaris, papilla lachrymalis, puncta, canaliculi, nasal sac and duct are indicated in this plate.

Plate 117.























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Author HENSMAN, A.

Brief title Anatomical outlines

(part 1, the upper limb)

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